C21.5: 967/3

Vol. 967 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

February 21, 1978

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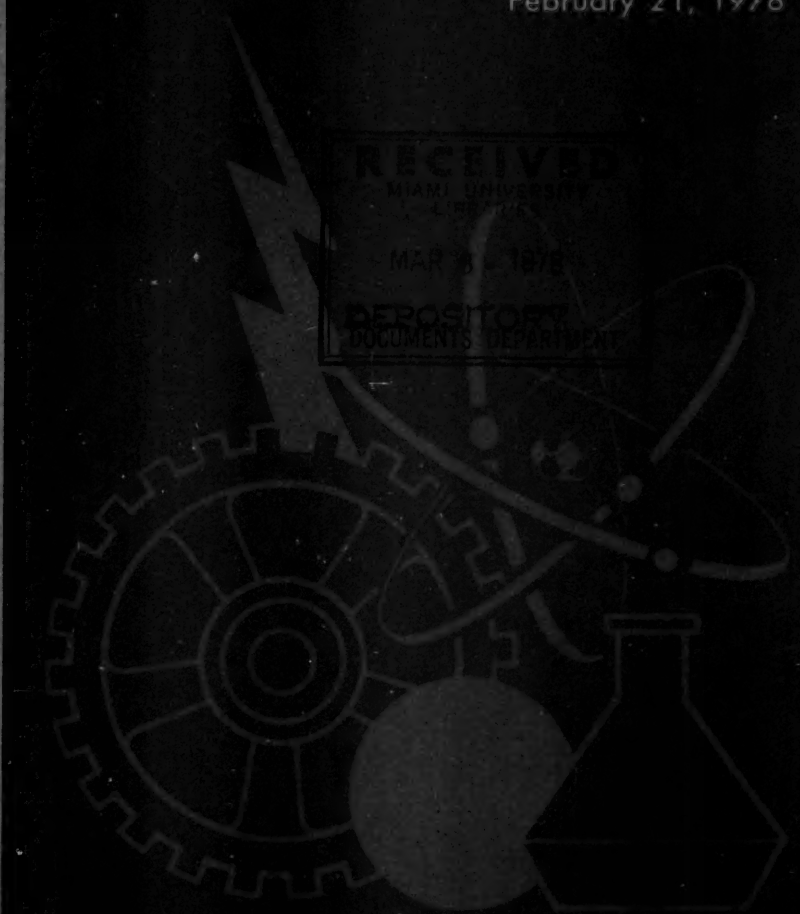

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

February 21, 1978 Volume 967 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

Chapter I—Patent and Trademark Office, Department of Commerce

Rule Promulgation Relating to Multiple Dependent Claims and Drawing Requirements

AGENCY: Patent and Trademark Office, Commerce

ACTION: Final Rule.

SUMMARY: This notice adopts rule changes which permit the use of multiple dependent claims and prescribe when, and in what circumstances, drawings or additional drawings need to be furnished. These rule changes are necessary because of amendments to sections 41, 112 and 113, Title 35 United States Code, which become effective on January 24, 1978. The rule changes are intended to carry into effect the changes made by the amendments to the noted sections.

DATES: Effective date, January 24, 1978. The amended rules apply to applications filed on and after the effective date, even though such applications may be entitled to the benefit of an earlier filing date.

FOR FURTHER INFORMATION CONTACT: Mr. Louis O. Maassel by telephone at (703) 557-3070, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: This notice changes several rules to conform with 35 U.S.C. sections 41, 112 and 113 as amended by Public Law 94-131, effective January 24, 1978, the date of entry into force of the Patent Cooperation Treaty. Notice was given on January 12, 1977 in the Federal Register (42 FR 2632-2644) and on February 8, 1977 in the OFFICIAL GAZETTE (955 O.G. 350-363) of a proposal to amend Title 37 of the Code of Federal Regulations due to the entry into force of the Patent Cooperation Treaty and Public Law 94-131 (94th Congress; 89 Stat. 658). Interested persons were invited to comment on the proposal on or before May 26, 1977, on which date a public hearing was held. The time for submitting written comments was extended until August 31, 1977 by a notice published on June 23, 1977 in the Federal Register (42 FR 31812) and on July 12, 1977 in the OFFICIAL GAZETTE (960 O.G. 8). Comments relevant to the rule changes being promulgated were submitted by only two persons. These comments have been subtantially adopted. A transcript of the hearing, the letters and written statements received, and a summary and analysis of the comments are available for public inspection in Room 11E10 of Crystal Plaza Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia. These changes provide for the filing of multiple dependent claims and for later submission of drawings in applications where such drawings are not necessary for the understanding of the subject matter sough to be patented. This rule change promulgation is directed to only those portions of the proposed rule changes relating to sections 1.75, 1.81 and 1.83 which are required on January 24, 1978, due to the coming into force of Public Law 94-131. The other proposed rules relating to implementation of the Patent Cooperation Treaty will be promulgated later.

Good cause is found for the publication of this notice less than 30 days before the effective date of these rules, since it would be in the public interest for the amended rules to take effect on the same date as the statute.

Paragraph (*c*) of Section 1.75 differs from the proposal in that two additional sentences have been added indicating how fees will be calculated for multiple dependent claims and claims depending therefrom. No comments were received concerning this rule as originally proposed.

Paragraph (*c*) of Section 1.81 has been rewritten to adopt a revision suggested by one of the two persons who submitted comments. Paragraph (*d*) is a quote from revised 35 U.S.C. 113 and is added to include the restrictions relating to additional drawings.

The proposed amendments to paragraphs (*a*) and (*b*) of Section 1.83 were opposed by both persons who commented and they have not been adopted, but a new paragraph (*c*) is added in view of those comments. Accordingly, 37 CFR Part 1 is amended as follows:

1. By amending Section 1.75 by revising paragraph (*c*) and adding paragraphs (*f*) and (*g*) to read as follows:

Section 1.75 *Claim(s).*

* * * * * * *

(*c*) One or more claims may be presented in dependent form, referring back to and further limiting another claim or claims in the same application. Any dependent claim which refers to more than one other claim ("multiple dependent claim") shall refer to such other claims in the alternative only. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim. For fee calculation purposes, a multiple dependent claim will be considered to be that number of claims to which direct reference is made therein. For fee calculation purposes, also, any claim depending from a multiple dependent claim will be considered to be that number of claims to which direct reference is made in that multiple dependent claim. Claims in dependent form shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim. A multiple dependent claim shall be construed to incorporate by reference all the limitations of each of the particular claims in relation to which it is being considered.

* * * * * * *

(*f*) If there are several claims, they shall be numbered consecutively in Arabic numerals.

(*g*) All dependent claims should be grouped together with the claim or claims to which they refer to the extent possible.

2. By revising Section 1.81 to read as follows:

Section 1.81 *Drawings required.*

(*a*) The applicant for a patent is required to furnish a drawing of his invention where necessary for the understanding of the subject matter sought to be patented; this drawing must be filed with the application.

(*b*) Drawings may include illustrations which facilitate an understanding of the invention (for example, flow sheets in cases of processes, and diagrammatic views).

(*c*) Whenever the nature of the subject matter sought to be patented admits of illustration by a drawing without its being necessary for the understanding of the subject matter and the applicant has not furnished such a drawing, the examiner will require its submission within a time period of not less than two months from the date of the sending of a notice thereof.

(*d*) Drawings submitted afer the filing date of the application may not be used to overcome any insufficiency of the specification due to lack of an enabling disclosure or otherwise inadequate disclosure therein, or to supplement the original disclosure thereof for the purpose of interpretation of the scope of any claim.

3. By adding a new paragraph (*c*) to Section 1.83 to read as follows:

Section 1.83 *Content of drawing.*

* * * * * * *

(*c*) Where the drawings do not comply with the requirements of paragraph (*a*) and (*b*) of this section, the examiner shall require such additional illustration within a time period of not less than two months from the date of the sending of a notice thereof. Such corrections are subject to the requirements of Section 1.81(d).

The Patent and Trademark Office has determined that this document does not contain a major proposal requiring preparation of an Economic Impact Statement under Executive Orders 11821 and 11949 and OMB Circular A–107.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

Approved: Jan. 12, 1978.

JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

[43 FR 4014]

Dated: Jan. 31, 1978.

[FR Doc. 78–2607; Filed 1–30–78; 8:45 am]

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,366,546, Re. S.N. 865,000, Filed Dec. 27, 1977, Cl. 176/40, NUCLEAR REACTOR, Andrew James Anthony, et al., Owner of Record: *Combustion Engineering, Inc., Windsor, Conn.,* Attorney or Agent: Eldon H. Luther, Ex. Gp.: 221

3,483,782, Re. S.N. 861,190, Filed Dec. 16, 1977, Cl. 83/202, SELF-CONTAINED FEED ROLL FOR POWER PUNCH PRESSES, Harry Eyberger, Owner of Record: *Vamco Machine and Tool Inc., Pittsburgh, Pa.,* Attorney or Agent: Stanley J. Price, Ex. Gp.: 324

3,557,796, Re. S.N. 865,610, Filed Dec. 29, 1977, Cl. 128/419, DIGITAL COUNTER DRIVEN PACER, John W. Keller, Jr., et al., Owner of Record: *Cordis Corporation, Miami, Fla.,* Attorney or Agent: Melvin R. Jenney, et al., Ex. Gp.: 335

3,737,153, Re. S.N. 846,782, Filed Oct. 31, 1977, Cl. 266/240, MOLTEN METAL HOLDING FURNACE SYSTEM, Theodore J. Steffora, et al., Owner of Record: *Lectromelt Corporation, Pittsburgh, Pa.,* Attorney or Agent: Fred Wiviott, et al., Ex. Gp.: 325

3,866,651, Re. S.N. 851,621, Filed Nov. 14, 1977, Cl. 152/313, FLAT FREE PNEUMATIC TIRE AND VOID FREE FILLING THEREFOR, Edward N. Gomberg, Owner of Record: *Inventor,* Attorney or Agent: John B. Young, et al., Ex. Gp.: 314

3,925,713, Re. S.N. 854,463, Filed Dec. 6, 1977, Cl. 318/575, AUTOMATICALLY GUIDING WORKPIECES THROUGH A MACHINE, Richard M. Richmond, Owner of Record: *The Shoe & Allied Trades Research Association, Kettering Northamptonshire, England,* Attorney or Agent: Lawrence I. Lerner, et al., Ex. Gp.: 217

3,926,061, Re. S.N. 863,181, Filed Dec. 16, 1977, Cl. 74/22 R, DIFFERENTIAL DRIVE ROTATING DISC IMPACT PRINTER, Gary R. Paulson, Owner of Record: *Hewlett-Packard Co., Palo Alto, Calif.,* Attorney or Agent: Michael L. Sherrard, Ex. Gp.: 345

3,926,422, Re. S.N. 861,100, Filed Dec. 15, 1977, Cl. 269/160, APPARATUS FOR SUPPORTING AND POSITIONING OF A WORK-PIECE DURING WELDING, Bobby R. Wilson, Owner of Record: *Inventor,* Attorney or Agent: Vern L. Oldham, et al., Ex. Gp.: 323

3,932,943, Re. S.N. 850,028, Filed Nov. 9, 1977, Cl. 34/5, METHOD OF PREPARATION OF LYOPHILIZED BIOLOGICAL PRODUCTS, Angelis R. Briggs, et al., Owner of Record: *E. I. Du Pont de Nemours and Company, Wilmington, Del.,* Attorney or Agent: James L. Jersild, Ex. Gp.: 344

3,934,333, Re. S.N. 854,058, Filed Nov. 23, 1977, Cl. 29/611, METHOD OF CONSTRUCTING BILATERAL HEATER UNIT, John W. Churchill, Owner of Record: *Inventor,* Attorney or Agent: Paul M. Craig, Jr., et al., Ex. Gp.: 321

3,942,178, Re. S.N. 861, 214, Filed Dec. 16, 1977, Cl. 343/5 PD, INTRUSION DETECTION SYSTEM, Kenneth R. Hackett, Owner of Record: *Pittway Corporation, Syosset, N.Y.,* Attorney or Agent: Sewall P. Bronstein, et al., Ex. Gp.: 222

3,974,107, Re. S.N. 862,381, Filed Dec. 20, 1977, Cl. 252/520, RESISTORS AND COMPOSITIONS THEREFOR, Peter Francis Carcia, Owner of Record: *E. I. Du Pont de Nemours and Co., Wilmington, Del.,* Attorney or Agent: James A. Forstner, Ex. Gp.: 223

3,982,486, Re. S.N. 844,116, Filed Oct. 17, 1977, Cl. 102/24 HC, NON EXPENDABLE POSITIONING FRAME FOR MULTIPLE EXPLOSIVE CHARGES, Robert E. Eckels, Owner of Record: *Inventor,* Attorney or Agent: Richard D. Law, Ex. Gp.: 221

3,986,673, Re. S.N. 844,515, Filed Oct. 25, 1977, Cl. 239/423, NOZZLE ASSEMBLIES FOR ATOMIZING AND MIXING DIFFERENT FLUIDS AND COMBINING THE MIXTURES WITH SOLIDS AND THE LIKE, Louis Beck, Owner of Record: *Inventor,* Attorney or Agent: Harold F. McNenny, Ex. Gp.: 313

3,999,292, Re. S.N. 864,932, Filed Dec. 27, 1977, Cl. 30/105, PIPE CUTTING TOOL, Clinton E. Breese, Owner of Record: *Breese Manufacturing, Inc., Jacksonville Beach, Fla.,* Attorney or Agent: George H. Baldwin, Ex. Gp.: 323

4,028,582, Re. S.N. 862,188, Filed Dec. 19, 1977, Cl. 313/422, GUIDED BEAM FLAT DISPLAY DEVICE, Charles Hammond Anderson, et al., Owner of Record: *RCA Corporation, New York, N.Y.,* Attorney or Agent: Eugene M. Whitacre, et al., Ex. Gp.: 252

PATENT NOTICES

Certificates of Correction for the Week of Feb. 21, 1978

Re. 29,326	4,036,979	4,048,004	4,053,699
D. 245,478	4,039,195	4,048,190	4,053,711
D. 246,259	4,040,146	4,048,241	4,053,767
3,652,867	4,040,984	4,048,254	4,053,898
3,676,339	4,041,279	4,048,255	4,054,186
3,708,601	4,041,623	4,048,282	4,054,273
3,781,936	4,041,631	4,048,312	4,054,306
3,843,761	4,042,107	4,048,510	4,054,520
3,846,189	4,042,372	4,048,570	4,054,675
3,883,576	4,042,610	4,048,597	4,054,689
3,953,058	4,042,683	4,048,663	4,054,824
3,970,253	4,043,240	4,048,672	4,055,065
3,975,753	4,043,790	4,049,368	4,055,384
3,975,835	4,043,791	4,049,982	4,055,575
3,983,155	4,043,835	4,050,482	4,055,596
3,985,969	4,043,963	4,050,523	4,055,597
3,986,012	4,044,076	4,050,762	4,055,627
3,988,815	4,044,253	4,050,802	4,055,669
4,009,291	4,044,297	4,050,951	4,055,897
4,012,520	4,044,408	4,051,008	4,056,118
4,012,598	4,044,643	4,051,504	4,056,254
4,013,513	4,045,248	4,051,641	4,056,547
4,013,894	4,045,294	4,051,645	4,056,567
4,017,526	4,045,378	4,051,670	4,056,573
4,017,623	4,045,419	4,051,677	4,056,637
4,017,646	4,045,667	4,051,708	4,056,658
4,017,746	4,045,758	4,051,762	4,056,847
4,019,039	4,045,780	4,051,805	4,056,854
4,020,271	4,045,833	4,052,043	4,056,975
4,021,365	4,045,972	4,052,178	4,056,988
4,025,400	4,045,994	4,052,244	4,057,003
4,027,019	4,045,995	4,052,527	4,057,082
4,027,104	4,046,132	4,052,594	4,057,135
4,027,203	4,046,181	4,052,628	4,057,143
4,028,932	4,046,488	4,052,692	4,057,171
4,029,882	4,046,545	4,052,717	4,057,236
4,030,372	4,046,859	4,052,751	4,057,337
4,032,621	4,046,885	4,053,101	4,057,445
4,033,279	4,047,119	4,053,130	4,057,782
4,033,519	4,047,156	4,053,236	4,058,102
4,034,642	4,047,411	4,053,252	4,058,266
4,034,959	4,047,441	4,053,347	4,058,268
4,035,112	4,047,454	4,053,544	4,058,310
4,035,318	4,047,531	4,053,613	4,058,327
4,036,082	4,047,619	4,053,618	4,064,577
4,036,864	4,047,906	4,053,632	

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 28, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-9-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	3-17-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-15-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-10-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-7-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-10-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-3-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-7-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-21-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-3-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-6-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-3-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	5-16-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-3-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-6-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	4-26-77

Expiration of patents: The patents within the range of numbers indicated below expire during January 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,966,681 to 2,970,312, inclusive
Plant Patents..... Numbers 2,009 to 2,018, inclusive

REISSUES

FEBRUARY 21, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,541

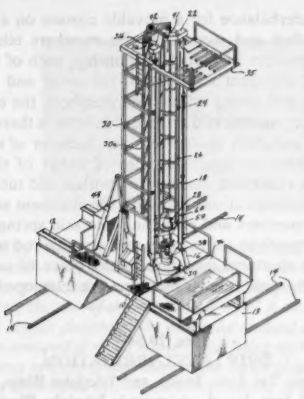
HYDRAULIC DRILLING RIG AND POWER SWIVEL

Duane K. Russell, Bothell, Wash., assignor to Western Gear Corporation, Everett, Wash.

Original No. 3,949,818, dated Apr. 13, 1976, Ser. No. 510,378, Sept. 30, 1974. Application for reissue Nov. 16, 1976, Ser. No. 742,278

Int. Cl.[2] E21B *19/14*

U.S. Cl. 175—52 **25 Claims**



15. The method of moving pipe in an earth-working operation including connecting pipe sections to a power swivel by threadably joining the sections to a rotary driven stem assembly of the power swivel and alternately tripping lengthy, connected pipe sections from the earth, the improvement comprising:

removing the rotary driven stem assembly from the power swivel, leaving a central passage; and

moving the pipe and the power swivel axially relative to each other for removal of the pipe from the earth by causing the pipe to move through said central passage.

Re. 29,542

POWER APPARATUS FOR TRUCK LOADING ELEVATOR

Lawrence I. Richards, Elk Grove Village, Ill., assignor to Autoquip Corporation, Chicago, Ill.

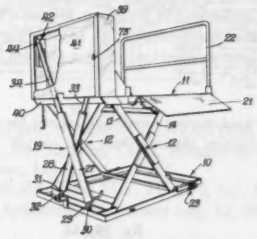
Original No. 3,880,259, dated Apr. 29, 1975, Ser. No. 331,641, Feb. 12, 1973. Application for reissue July 12, 1976, Ser. No. 704,476

Int. Cl.[2] B66B *11/04*

U.S. Cl. 187—18 **7 Claims**

8. In an apparatus such as a dock lift or the like and for use with a source of hydraulic fluid under pressure, said apparatus comprising a frame having two sides and two ends, a vertically movable platform device above the frame and also having two corresponding sides and two corresponding ends, two pair of scissors means respectively connecting opposite sides of the frame and platform device, and power means at one end of the frame and connecting the frame and platform device for vertically moving the platform device with respect to the frame, the improvement comprising:

said power means comprising two hydraulic cylinders each cylinder having a closed end, a piston rod extending from the other end of the cylinder and connecting members on the closed end and the distal end of the piston rod, one of said cylinders having one member thereof pivotally secured to the frame at one side and the second member thereof pivotally secured to the platform device at the other side, the other of said cylinders having one member thereof pivotally secured to the frame at said other side and the second member thereof pivotally secured to the platform device at said one side, each cylinder having a first hydraulic connection adjacent the closed end thereof and a second hydraulic connection adjacent the other end thereof, said power means including two hydraulic fluid conduits, one of said conduits communicating with the first connection of one cylinder and the second connection of the other cylinder to provide fluid communication therebetween, the other of said conduits communicating with the second connection of said one cylinder and the first connection of said other cylinder to provide fluid communication



therebetween, fluid supply line means through which hydraulic fluid flows from said source when said platform device is to be raised and through which hydraulic fluid returns from said cylinders when said platform device is to be lowered, and means connecting the fluid supply line means and said conduits for preventing hydraulic fluid from flowing from said one of said conduits to said other of said conduits when the platform device is not being raised or lowered, whereby a load imposed on said platform at a first side thereof will push down on the hydraulic cylinder connected to said first side of the platform which hydraulic cylinder will in turn act through the respective communication to energize the other hydraulic cylinder to apply a downward pulling force on the other side of the platform.

Re. 29,543

ELEVATOR CONTROL SYSTEM

William Frank Glaser, Eastchester, N.Y., assignor to Otis Elevator Company, New York, N.Y.

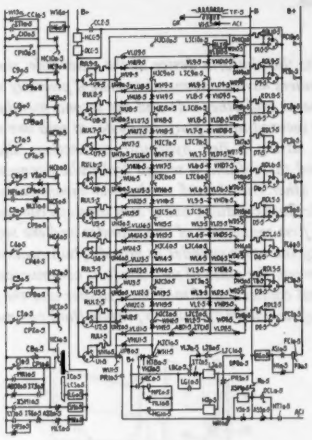
Original No. 3,412,826, dated Nov. 26, 1968, Ser. No. 249,977, Jan. 3, 1963. Continuation of Ser. No. 92,549, Nov. 24, 1970, which is a continuation of Ser. No. 304,163, Aug. 13, 1952, abandoned. Application for reissue Nov. 12, 1975, Ser. No. 631,288

Int. Cl.[2] B66B *1/18*

U.S. Cl. 187—29 R **43 Claims**

33. In an elevator control system, in combination, a plurality of cars arranged to serve a plurality of floors, means for registering calls for service, means for each car for stopping the car at floors at which calls are registered, a sensing circuit comprising unilateral conducting devices corresponding to the path of the cars, a source of power having a first and a return lead, means for energizing the sensing circuit from the first lead at points corresponding to registered calls, said sensing circuit in response thereto conducting current in two directions for calls registered at floors intermediate the terminal floors, said two directions corresponding to both directions in which a car can travel from said intermediate floors, current responsive means connected to the sensing circuit and to

the return lead arranged to shunt current from said circuit at points corresponding to the car positions, and car starting means



actuated by said current responsive, means for starting said car in response to current shunted from said circuit.

Re. 29,544

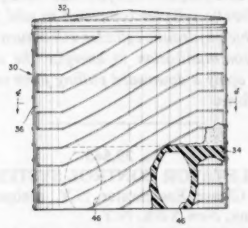
ENERGY ABSORBING DECELERATION BARRIERS

John C. Fitch, Lakeville, Conn., assignor to Energy Absorption Systems, Inc., Chicago, Ill.

Original No. 3,606,258, dated Sept. 20, 1971, Ser. No. 788,890, Jan. 2, 1969. Continuation-in-part of Ser. No. 665,359, Sept. 5, 1967, abandoned. Application for reissue Dec. 6, 1976, Ser. No. 748,122

Int. Cl.² E01F *15/00*

U.S. Cl. 256—13.1 **11 Claims**



1. Sacrificial inertial barrier apparatus for decelerating a vehicle as it approaches a hazardous area comprising at least one frangible barrier unit adapted to be positioned in the path of said vehicle in a manner to be substantially freely displaceable upon impact by said vehicle, at least the upper portion of said unit comprising a dispersible mass of predetermined density and said unit having a lower light-weight collapsible support portion, the density of said lower support portion being appreciably below said predetermined density, the mass and density of said upper portion of said unit being so related to the mass and density of said lower support portion as to dispose the center of gravity of said barrier units substantially at the level of the center of gravity of said vehicle *when said barrier unit is in a static state prior to impact as well as during the incidence of impact* whereby upon impact the inertia of the dispersible mass decelerates the vehicle without imparting a substantial vertical moment to the vehicle.

Re. 29,545

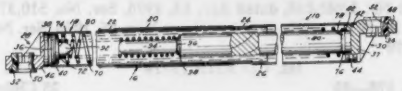
CLOSURE COUNTERBALANCE

Robert J. Deisenroth, Durango, Colo., assignor to Excel Industries, Inc., Elkhart, Ind.

Original No. 3,797,817, dated Mar. 19, 1974, Ser. No. 265,334, June 22, 1972. Application for reissue Feb. 19, 1976, Ser. No. 659,203

Int. Cl.² F16F *3/04*

U.S. Cl. 267—71 **13 Claims**



1. A counterbalance for a movable closure on a structure, comprising first and second tubular members telescopingly connected together in sliding relationship, each of said members having abutment structure at the outer end thereof, a compression coil spring within said members, the end of said spring pressing against said abutment structures thereby urging said tubular members apart, the outer diameter of said spring being less than the inner diameter of either of the tubular members, an elongated wooden rod within said tubular members in engagement at one end with the abutment structure of one of said members and extending into said spring in sliding contact therewith to guide same, said wooden rod terminating short of the abutment structure of the other of said tubular members when said tubular members are telescoped together.

Re. 29,546

DRIP LEVEL IRRIGATION

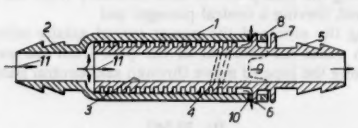
Symcha Blass, Tel Aviv, Israel, and Ishajahu Blass, 26 Maneh Street, Tel Aviv, Israel, assignors to Ishajahu Blass, Tel Aviv, Israel

Original No. 3,604,728, dated Sept. 14, 1971, Ser. No. 861,123, Sept. 25, 1969. Application for reissue Sept. 12, 1973, Ser. No. 396,948

Claims priority, application Australia, Jan. 3, 1969, 48630/69

Int. Cl.² F16L *55/00*

U.S. Cl. 285—14 **11 Claims**



1. An irrigation dripper unit to connect adjacent pipeline sections, comprising an outer tubular member and an inner tubular member, each having first and second opposite end portions, said inner tubular member being axially slidable into said outer tubular member, means retaining said inner tubular member within the outer tubular member, the first end portion of the outer tubular member being disposed adjacent and projecting beyond the second end portion of the inner tubular member, the first end portion of the inner tubular member being disposed adjacent and projecting beyond the second end portion of the outer tubular member, said first end portions of said tubular members serving to connect adjacent pipeline sections, a continuous elongated helical groove formed in the surface of one of the tubular members and defining a continuous conduit with respect to the contiguous surface of the other tubular member, one end of said helical conduit being disposed adjacent the second end portion of the inner tubular member and defining an inlet communicating with the interior of said inner tubular member, at least one port defining an outlet formed in said unit adjacent to and communicating with the opposite end of the helical conduit and the exterior of said unit whereby said conduit defines a continuously open path to the

exterior of the unit, for flow of a portion of the fluid that may be flowing through the interior of said inner tubular member.

Re. 29,547

NICKEL SILICON AND REFRACTORY METAL ALLOY

William Harrison Severns, Jr., Wilmington, Del., and Gaylord Darrel Smith, Mountainside, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 3,361,560, dated Jan. 2, 1968, Ser. No. 543,651, Apr. 19, 1966. Continuation-in-part of Ser. No. 269,818, April 1, 1963, Pat. No. 3,257,178. Application for reissue Aug. 16, 1974, Ser. No. 498,229

Int. Cl.[2] C22C *19/00*

U.S. Cl. 148—32 **20 Claims**

14. An alloy consisting essentially of a substantial amount of at least one metal A and a substantial amount of cobalt, and silicon, metal A being selected from the group consisting of molybdenum and tungsten; the sum of the amounts of metal A and cobalt being at least 60 atomic percent of the alloy; the amount of silicon and the relative amounts of metal A and cobalt being such as to provide 30–85 volume percent of said alloy in the Laves phase; said Laves phase being distributed in a relatively soft matrix of the remaining 70–15 percent of said alloy.

Re. 29,548

JOINT SEALANT COMPOSITION

Dana C. Payne, Alameda, and Jack L. Chandler, Hayward, both of Calif., assignors to Superior Products Company, Inc., Sparks, Nev.

Original No. 3,549,575, dated Dec. 22, 1970, Ser. No. 819,415, Apr. 25, 1969. Continuation-in-part of Ser. No. 535,004, March 17, 1966, abandoned. Application for reissue May 10, 1976, Ser. No. 684,751

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—28.5 AS **13 Claims**

1. A single component liquid hot pour type joint sealant composition comprising, about 2 to 25% vinyl chloride resin, and a liquid coal tar pitch component consisting essentially of a pitch fraction having a boiling point of between about 355° C. and about 450° C.

Re. 29,549

PACKAGE FOR ENCAPSULATED ELECTRICAL COMPONENTS

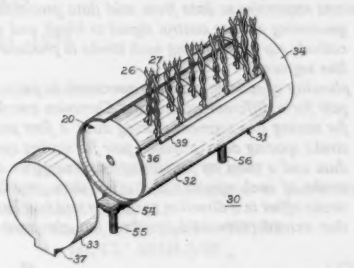
Joseph T. Charles, Arlington Heights, Ill., assignor to Coil Sales & Manufacturing Company, Rolling Meadows, Ill.

Original No. 3,691,294, dated Sept. 12, 1972, Ser. No. 78,630, Oct. 5, 1970. Continuation-in-part of Ser. No. 877,384, Nov. 17, 1969, abandoned. Application for reissue Jan. 7, 1974, Ser. No. 431,365

Int. Cl.[2] H01F *17/08, 15/02, 27/04*

U.S. Cl. 178—46 **12 Claims**

1. A package for encasing a plurality of encapsulated electrical components each having at least a pair of leads, comprising: an elongated hollow case adapted to receive a plurality of said electrical components in an end-to-end relation, said case having a continuous slot extending along a first line parallel to the longitudinal axis of said case between its enclosed ends for passing said leads to the outside of said case and having means for permitting removal of individual electrical components from said case, and means on the outside of said case for mounting the package, said mounting means disposed along a second line parallel to the longitudinal axis of said case and offset from a plane passing through said first line and the longitudinal axis of said case, said mounting means including a guide track and at least a pair of mounting studs having an enlarged head slidably supported in said guide track, said mounting studs including a locking nut for locking said studs in place.



Re. 29,550

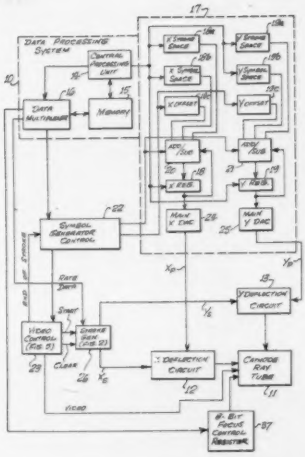
GRAPHIC SYMBOL GENERATOR

John A. Bantner, Los Angeles, Calif., assignor to Information International Inc., Los Angeles, Calif.

Original No. 3,946,365, dated Mar. 23, 1976, Ser. No. 424,220, Dec. 13, 1973. Application for reissue Aug. 12, 1976, Ser. No. 713,667

Int. Cl.[2] G06F *15/20, 3/14;* **B41B** *19/14*

U.S. Cl. 364—900 **16 Claims**



17. Apparatus employing a cathode ray tube for displaying lines of graphic symbols by displaying parallel line segments using the electron beam of the cathode ray tube having deflection circuits connected to a data processing system which stores in digital form control data for generation of symbols to be displayed on a baseline, including data which defines the starting point of said baseline for said line of graphic symbols in a fixed Cartesian coordinate system, comprising

analog deflection control means responsive to digital signals for producing analog deflection control signals X_p and Y_p for said beam in said Cartesian coordinate system,

X and Y registers for storing digital values for said analog deflection control means, said digital values being provided as a line starting point by said data processing system for each line of symbols,

a pair of digital means for adding and subtracting deflection control values to the contents of said respective X and Y registers,

means responsive to data from said data processing system for generating stroke signals X_s and Y_s applied to said respective X and Y deflection control means for each successive stroke,

means responsive to data from said data processing system for generating a video control signal to blank and unblank said cathode ray beam during each stroke to produce said parallel line segments,

a plurality of spacing registers associated in pairs, one of each pair for a different axis of said Cartesian coordinate system for storing line segment spacing data, a first pair for storing stroke spacing data, a second pair for storing symbol spacing data and a third set for storing baseline offset data for each stroke of each symbol, said offset data providing not only stroke offset in a direction normal to said baseline for symbols that extend below said baseline, but also stroke offset in a direction parallel to said baseline for symbols that are slanted with respect to said baseline, all of said paired registers being conneced to said pair of digital means for adding and subtracting deflection control values,

means responsive to control of said data processing system for updating the contents of said X and Y registers and said paired spacing registers, and

means responsive to control of said data processing system for adding the contents of respective ones of a pair of spacing data registers to said X and Y registers during the course of displaying a line of symbols by generating on the face of said cathode ray tube a sequence of symbols with respect to an imaginary line coincident with said baseline and anywhere on said face with any orientation in respect to said fixed Cartesian coordinate system.

PLANT PATENTS

GRANTED FEBRUARY 21, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,216

AFRICAN VIOLET PLANT

Reinhold Holtkamp, Wertherstrasse 112, 4294 Isselburg, Germany

Filed Nov. 30, 1976, Ser. No. 746,192
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name Maryland and characterized particularly as to uniqueness by the combined characteristics of large star-shaped flowers which are medium blue in flower color and non-dropping; generally round, medium green foliage; erect, upright and strong flower stems; compact growth habit; continuous flowering and very uniform first flowering, approximately 6–7 weeks after potting.

4,217

CHRYSANTHEMUM PLANT

John Robert Culbert, Monticello, Ill., assignor to University of Illinois Foundation, Urbana, Ill.

Filed Mar. 3, 1977, Ser. No. 773,978
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of chrysanthemum plant substantially as herein shown and described, characterized particularly as to novelty by anemone type flowers consisting of white spooned ray florets loosely arranged in 1 to 2 concentric rows about the yellow cushion of disc florets which results in the dainty, airy, bicolor appearance of the flowers, by the slow development of the flowers which remain attractive from their youngest open stage past full maturity resulting in long "shelf life", by the versatile nature of the flowers in that they may be grown either disbudded for increased size or in sprays for increased production of smaller flowers, by flower buds which develop normally in from 7½ to 9 weeks from start of initiation throughout the year, and by strong, leafy plants which average 3 to 5 breaks per pinched plant making a showy display of 3¼" to 4" disbudded flowers or of 2" to 3" flowers borne in sprays.

PATENTS

GRANTED FEBRUARY 21, 1978

ERRATA

For CLASS	See PATENT NO.
126–276	4,074,704
126–271	4,074,705
126–271	4,074,706
126–343.5 A	4,074,707
126–360 A	4,074,708
128–002 A	4,074,709
128–002.05 P	4,074,710
128–002.05 A	4,074,711
128–079	4,074,712
128–92 C	4,074,713
128–218 P	4,074,714
128–218 P	4,074,715
128–287	4,074,716
128–303.1	4,074,717
128–303.14	4,074,718
128–303.1	4,074,720
128–461	4,074,721
131–008 R	4,074,722
131–198 R	4,074,723
131–267	4,074,724
366–007	4,074,894
418–068	4,074,954
062–128	4,074,987
206–546	4,075,078
544–018	4,075,203
560–073	4,075,241
560–190	4,075,242
260–876 B	4,075,285
260–877	4,075,286
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260–879	4,075,288
260–890	4,075,289
260–897 A	4,075,290
260–933	4,075,291
260–986	4,075,292
261–020	4,075,293
261–034 A	4,075,294
261–036 R	4,075,295
261–041 D	4,075,296
261–104	4,075,297
261–114 TC	4,075,298
264–25	4,075,299
264–032	4,075,300
264–040.7	4,075,301
264–043	4,075,302

264–044	4,075,303
264–046.5	4,075,304
429–161	4,075,368
235–420	4,075,460
235–466	4,075,461
235–302.3	4,075,466
362–031	4,075,467
362–072	4,075,469
362–287	4,075,470
362–300	4,075,471
362–255	4,075,472
256–013.1	4,075,473
315–209	4,075,476
365–154	4,075,609
365–107	4,075,610
365–002	4,075,611
365–171	4,075,612
365–087	4,075,613
364–200	4,075,679
365–156	4,075,690

PATENTS

GRANTED FEBRUARY 21, 1978

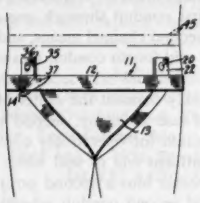
GENERAL AND MECHANICAL

4,074,364

HOLD-DOWN DEVICE FOR SHIRTS AND THE LIKE

Gerald N. Lucero, 4161 E. Mission, No. 17, Pomona, Calif. 91766

Filed June 7, 1976, Ser. No. 693,340
Int. Cl.[2] A41B *3/04*
U.S. Cl. 2—117 **6 Claims**



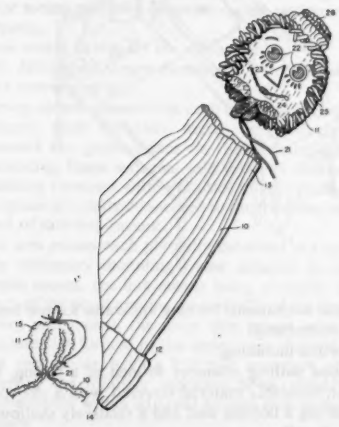
1. A hold-down device for a shirt comprising
an elastic hipband for surrounding the hips of a wearer,
front and rear elastic fabric flaps secured to said hipband,
said flaps converging downwardly to fit the crotch of said wearer,
means attaching the lower ends of said flaps together,
upstanding tabs attached to said hipband and spaced therealong, and means for removably attaching the lower portion of said shirt to said tabs.

4,074,365

CAP AND METHOD OF MANUFACTURE

Walter E. Schuessler, 800 Redbud Lane, Wilmette, Ill. 60091, and Richard D. Schuessler, 142 Abingdon, Kenilworth, Ill. 60043

Filed Jan. 28, 1977, Ser. No. 762,658
Int. Cl.[2] A42B *1/04*
U.S. Cl. 2—201 **9 Claims**



1. A cap comprising a knitted tubular head portion having an open lower end adapted to fit over the head of a wearer and an upper end, a bag-like top portion having an opening forming a pocket therein, the upper end of the head portion extending through the opening into the pocket of the top portion, and constricting means extending around the opening of the top portion for constricting the opening about the head portion.

4,074,366

POLY(N-ACETYL-D-GLUCOSAMINE) PRODUCTS

Richard Carl Capozza, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 558,525, March 14, 1975, Pat. No. 3,989,535, which is a division of Ser. No. 441,717, Feb. 11, 1974, abandoned, which is a division of Ser. No. 558,526, March 14, 1975, Pat. No. 3,988,411. This application July 22, 1976, Ser. No. 707,912
Int. Cl.[2] A61F *1/00*
U.S. Cl. 3—1 **3 Claims**

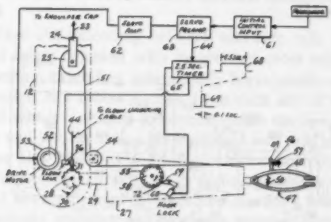
1. A surgical prosthesis comprising non-absorbable filaments shaped as a living tissue reinforcing element, and mixed with and coacting with said non-absorbable filaments, in at least a part of the element, a structure consisting essentially of poly(N-acetyl-D-glucosamine), whereby on implantation in living tissue, the poly(N-acetyl-D-glucosamine) is absorbed by the living tissue which replaces the poly(N-acetyl-D-glucosamine) and interlocks with the non-absorbable filaments, said prosthesis being sterile at time of implantation.

4,074,367

PROSTHETIC LOAD-LIFT HOOK LOCKING MECHANISM

John H. Loveless, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of Veterans' Affairs, Washington, D.C.

Filed Sept. 16, 1976, Ser. No. 724,062
Int. Cl.[2] A61F *1/00, 1/06*
U.S. Cl. 3—1.1 **7 Claims**

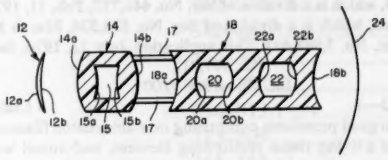


1. In an artificial limb unit, an upper arm portion, a forearm member pivoted to said upper arm portion to define an elbow joint, a terminal device on the end of said forearm member, a drive motor on said upper arm portion, means to energize said motor, power transmission means drivingly interconnecting said motor, forearm member and terminal device for elevating said forearm member, and means on said forearm member locking said terminal device while the forearm member is being elevated by said motor; said power transmission means comprising a cable and pulley system operatively coupling said motor, forearm member and terminal device; said cable and pulley system including a cable portion extending along said forearm member toward said terminal device and being operatively connected to said terminal device; and said means locking the terminal device comprising means locking said cable portion against movement while the forearm member is being elevated, which comprises a ratchet wheel journalled on said forearm member, means coupling said cable portion to said ratchet wheel, movable pawl means on the forearm member lockingly engageable with said ratchet wheel, and pawl operating means for lockingly engaging said pawl means with said ratchet wheel during the elevation of said forearm member.

4,074,368
INTRAOCULAR LENS WITH HIGH MAGNIFICATION

Chauncey F. Levy, Jr., 1299 Portland Ave., Rochester, N.Y. 14621, and Richard J. Pegis, Rochester, N.Y., assignors to said Chauncey F. Levy, Jr., by said Richard J. Pegis

Filed Sept. 8, 1976, Ser. No. 721,198
Int. Cl.[2] A61F 1/16, 1/24
U.S. Cl. 3—13 8 Claims

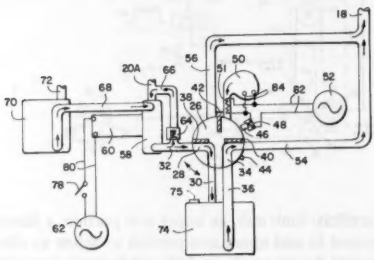


1. An intraocular lens system comprising a body of a transparent material of a size and shape for implantation in the human eye and having front and rear surfaces, said body including a plurality of transparent bubbles completely enclosed therein and optically in tandem along the length thereof, the transverse internal surfaces of said body that define the front and rear boundaries of said bubbles being optically curved for refracting light passing lengthwise through said body and said bubbles between the front and rear surfaces of said body, the boundaries of a bubble adjacent to the front surface being curved for positive refraction of light and the boundaries of a bubble adjacent to the rear surface being curved for negative refraction.

4,074,369
SHAMPOOING UNIT

Flossie G. Harmon, 3109 N. 15th St., Philadelphia, Pa. 19132

Filed July 8, 1976, Ser. No. 703,690
Int. Cl.[2] A61H 35/00
U.S. Cl. 4—159 4 Claims

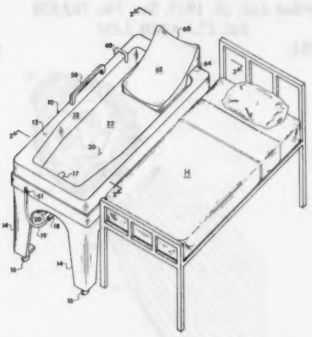


1. A portable shampooing unit comprising lightweight flexible hood means, sealing means extending around the opening in said hood for holding said hood to the scalp area of the head of a person and substantially preventing leakage of air, shampoo and water from said hood when said hood is in position, flexible manifold means in said hood, first conduit means leading into said manifold opening means in said manifold to provide fluids adjacent the scalp area of a person wearing said hood, second conduit means leading out of said hood for venting said hood of liquid or air, water supply means operatively connected to water pump means, shampoo supply means, air pump means and first valve means, said first valve means being movable into a first position for operatively connecting the discharge end of said water pump and said shampoo supply with said first conduit, said first valve being movable into a second position for operatively connecting the discharge end of said water pump with said first conduit, said first valve being movable into a third position for operatively connecting the discharge end of said air pump with said first conduit, said first valve means comprises a rotary valve having first channel means and second channel means simultaneously movable therein, said first valve operatively connected to said first conduit through third conduit means and fourth conduit means leading from said first valve into said first conduit, said first valve being rotatable into a first position for operatively connecting said pump and the inlet end of said shampoo supply through said first channel and simultaneously connecting said second channel with the outlet end of said shampoo supply and said fourth conduit, said first valve movable into a second position for operatively connecting the outlet end of said pump and said third conduit through said first channel, said first valve movable into a third position for connecting the outlet of said air pump to said first conduit through one of said first channel means and said second channel means, and one of said third conduit means and said fourth conduit means, means for preventing said first channel and said second channel from being rotated to operatively connect the outlet of said water pump with the outlet of said air pump, second valve means movable into a first position for operatively connecting said second conduit to the influent end of said water pump, said second valve being movable into a second position for discharging fluids from said second conduit whereby shampoo and water can be delivered under pressure to said manifold through said first conduit and provide an agitating action in said hood after which said shampoo or water may be recirculated through said second conduit into said pump to provide efficient use of shampoo or rinse water after which such shampoo or rinse water may be discharged and an air stream for drying hair can be introduced into the hood and vented from the hood.

4,074,370
BATHING APPARATUS FOR HOSPITAL OR BEDRIDDEN PATIENTS

George W. Harmony, III, Marion, Va., assignor to Mediglas, Inc., Charlotte, N.C.

Filed Apr. 2, 1976, Ser. No. 673,290
Int. Cl.[2] A47K 3/0, 3/022
U.S. Cl. 4—173 R 5 Claims



1. A portable institutional bathing apparatus for use beside a hospital bed comprising:

a. a tub portion including:

i. a molded bathing chamber formed of a strong, lightweight, moldable material covered with a gel coating and having a bottom wall and a relatively shallow side and end walls;

ii. a skirt substantially surrounding said molded bathing chamber and depending from the upper edge of said side and end walls and extending downwardly a distance greater than the depth of said side and end walls;

iii. a reinforcing plate secured to and extending between the opposite sides and ends of said skirt in supporting relation to the undersurface of said bottom wall;

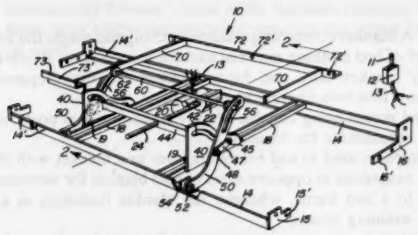
b. a leg frame attached to and supporting said tub portion and including a plurality of legs with casters at the lower extremities thereof;
c. a drain opening in said bottom wall in communication with a drain conduit means, and a pump in operative communication with said drain conduit for depositing drain water where desired, even to locations of higher elevation; and
d. an extensible fill hose means separate from said drain conduit means and mounted on said apparatus having an outlet into said bathing chamber and means at the opposite end for connection to conventional available faucets, whereby fill water is introduced directly from institutional plumbing into said bathing chamber.

4,074,371

MOTORIZED HIDE-A-BED ACTUATING MECHANISM

John L. Lindbloom, Overland Park, Kans., assignor to Christian Services, Inc., Lee's Summit, Mo.

Filed Aug. 4, 1976, Ser. No. 712,608
Int. Cl.[2] A47C *17/14*
U.S. Cl. 5—13 **5 Claims**



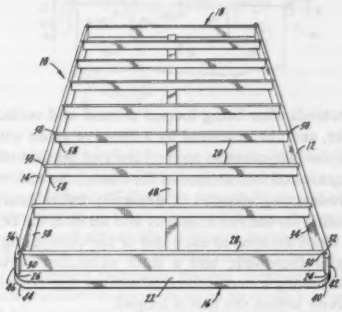
1. An actuation apparatus for causing translation of movable portions of a sofa bed and the like between different functional conformations, the apparatus comprising:
a stationary mounting frame connected to stationary portions of the sofa bed;
guide means mounted on the stationary mounting frame on opposite sides thereof, the guide means each having an S-shaped slot formed therein, the slots being aligned;
motor means pivotally mounted on the stationary mounting frame;
screw means driven by the motor means;
cross drive shaft means mounted for driven movement on the screw means;
follower means mounted on each end of the cross drive shaft means, each follower means respectively extending toward the guide means on that side of the stationary mounting frame adjacent said follower means and being slidably received within the slot in said guide means;
link means pivotally connected to the follower means at one end of said link means;
pivot arm means each pivotally mounted at a lower end to the stationary mounting frame adjacent to each of the guide means, the link means being pivotally mounted to each of the pivot arm means medially of the lengths of said pivot arm means, the pivot arm means each having an arcuate slot formed in the upper ends thereof;
cross rod means having follower members at each end thereof, the follower members being slidably received respectively within adjacent arcuate slots in the pivot arm means;
a movable frame mounted to the movable portions of the sofa bed, the cross rod means being connected to the movable frame; and,
switch means for activating the motor means, energization of the motor means driving the screw means to cause the cross drive shaft means to be linearly displaced, the follower means following the S-shaped slots in the guide means to cause the link means and the pivot arm means pivotally connected thereto to be displaced vertically, the cross rod means following the slots in the pivot arm means to displace vertically the movable frame and thus the movable portions of the sofa bed connected thereto.

4,074,372

FOUNDATION UNIT FRAME

Martin Schulz, Jr., Brenham, Tex., assignor to Steadley Company, Inc., Carthage, Mo.

Filed Apr. 9, 1976, Ser. No. 675,472
Int. Cl.[2] A47C *23/04*
U.S. Cl. 5—263 **7 Claims**



1. A framework structure for a foundation unit including
a. a pair of spaced, elongated parallel side rails oriented with their greatest cross sectional dimension extending generally vertically,
b. a pair of end members extending between said side rails at opposite ends thereof, each of said end members comprising:
i. a base slat extending between said side rails, said base slat being oriented with its greatest cross sectional dimension extending substantially horizontally and being located in a recess excised from each end of each side rail which is shaped to accommodate the base slat, and
ii. an end slat extending between said side rails above said base slat, said end slat being oriented with its greatest cross sectional dimension extending generally vertically and having formed at either end thereof a tenon which matingly engages a conforming mortise excised from each side rail, said tenon being formed in a wedge-shaped, dovetail configuration such that said tenon and said mortise interlock in a tongue and groove fashion,
c. a plurality of cross slat members extending between said side rails intermediate the ends thereof, each of said cross slat members being oriented with its greatest cross sectional dimension extending generally vertically, said greatest cross sectional dimension of the cross slat members being less than the greatest cross sectional dimension of said side rails, and
d. means interlocking each end of said cross slat members internally within said side rails to prevent relative movement therebetween.

4,074,373

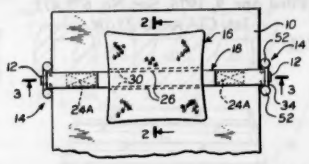
SYSTEM FOR ATTACHING PILLOW TO X-RAY TABLE

Frank S. Garofalo, Old Westbury, N.Y., assignor to F. Garofalo Electric Co., Inc., Brooklyn, N.Y.

Filed Feb. 6, 1976, Ser. No. 656,006
Int. Cl.[2] A47C *21/00*
U.S. Cl. 5—325 **10 Claims**

1. A system for attaching a pillow to an X-ray table or the like, including, in combination, a belt for connection with a pillow with which the system is intended to be used, belt

holders for opposite sides of the table, one of the belt holders including means for detachably securing it to one edge of the table and having a surface extending generally transverse of the length of the belt and around which the belt is looped to change the direction in which the belt extends around an angle of approximately 180°, whereby an end portion of the belt extends along a part of the belt between the pillow and the belt holder, and detachable fastening means that connect the end portion of the belt with said part of the belt over which the end



portion extends after being looped around said surface of the belt holder, and characterized by a concave guide with which an end of the belt contacts to lead the end portion of the belt into a loop around said surface of the clamp, the concave guide being a connecting element of generally cylindrical contour and extending for the full length of said surface, the belt holder having a block secured to each end of the connecting element and integral therewith, and a shaft extending between the blocks and having a circumferential surface that constitutes the surface about which the belt is looped.

4,074,374

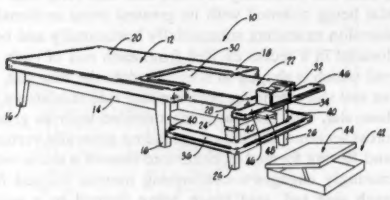
READING BED

Mark G. Ayesh, 1510 Lane, Apt. B6, Topeka, Kans. 66604

Filed Oct. 18, 1976, Ser. No. 733,243

Int. Cl.[2] A47C *21/00*

U.S. Cl. 5—327 R **5 Claims**



1. A reading bed for reading for extended periods, the bed comprising:

a padded elongated horizontal body support for supporting the lower portion of the body, said body support mounted on a body support frame having vertical legs attached thereto for supporting said body support thereon;

an elongated "T" shaped head board hingeably attached to one end of said body support for supporting the upper portion of the body, said head board mounted on a head board frame having vertical legs attached thereto for supporting said head board thereon;

a head pillow hingeably attached to said head board for supporting the head of the body;

a horizontal "U" shaped adjustable arm support shelf, said shelf attached to said head board frame, and one end of said body support frame for supporting the arms of the body; and

a plurality of parallel horizontal grooves in said vertical legs of said body support frame and said head board frame for receiving a portion of said arm support shelf, by selecting corresponding parallel grooves in said legs, the height of said shelf is adjusted.

4,074,375

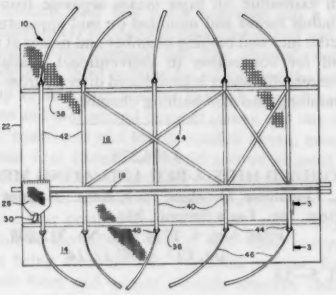
UTILITY SECURITY BLANKET

Harry Y. Kella, P.O. Box 483, La Mesa, Calif. 92041

Continuation-in-part of Ser. No. 683,914, May 5, 1976, abandoned. This application Dec. 20, 1976, Ser. No. 752,027

Int. Cl.[2] A47G *23/00, 9/00*

U.S. Cl. 5—336 **3 Claims**



1. A blanket comprising a simple rectangular single thickness panel of bed clothing material suitable for use as an above-the-body blanket only and having means for easy separation thereof into two discrete portions;

said means being capable of easy re-uniting said portions to reconstitute the blanket;

straps secured to and extending over said blanket with strap extensions at opposite sides of said blanket for securement to a bed frame, whereby the blanket functions as a restraining means;

said strap extensions having means for easy detachment from said straps;

said means for separation into portions being a slide fastener extending along a line effectively from end to end of the blanket and said straps also being discontinuous along said line so that the blanket can be separated into two portions, by an attendant, without untieing said strap extensions.

4,074,376

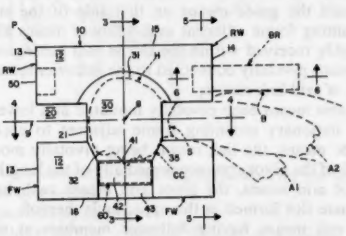
CONTOURED SECURITY PILLOW

Helen Inez Bond, 19416 Northeast Ave., Battle Ground, Wash. 98604

Filed Mar. 30, 1977, Ser. No. 782,619

Int. Cl.[2] A47G *9/00*

U.S. Cl. 5—338 **11 Claims**



1. A contoured security pillow adapted to receive one shoulder and a symmetrical side of the head of a hemiside reclining person, said pillow comprising a resiliently compressible pad extending uprightly along a vertical-axis and lengthwise along a longitudinal-axis and said pad including: a top-side, a bottom-side intersecting said vertical axis and adapted to be stably superimposed upon a sleeping bed or similar reclining substrate, and a pair of longitudinally separated upright ends including a left-end and a right-end, and a pair of transversely

separated upright sides including a front-side and a rear-side, said pad being provided with the following contours:

A. A facerest depending from the pad top-side and surrounding the pad vertical-axis, said facerest including a higher elevation rear-contour portion that slopes gently downwardly toward and merges with a lower front-contour portion;

B. At least one longitudinal channel to accommodate the reclining person's shoulder adjacent his downward facial cheek, said channel having its trailing-end at a pad end and an upright leading-end at the facerest and being located one-third to two-thirds the distance from said pad end to the vertical-axis thereof, said longitudinal channel throughout intersecting the pad top-side and bottom-side and thereby providing a pillow rear-wing and front-wing, said front-wing adjacent the channel leading-end including a chin-restraint portion extending uprightly adjacent the facerest front-contour; and

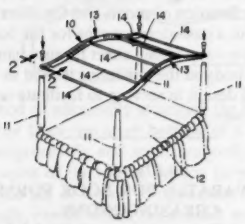
C. A frontal cutaway commencing at the pad front-side and extending transversely rearwardly therefrom and terminating at the facerest front-contour, said frontal cutaway also extending through the pad top-side whereby the directionally forward vision of the hemiside reclining and faceresting pillow user is unobstructed by the pillow frontal parts.

4,074,377

BED CANOPY FRAME

Kenneth H. Gutner, 3285 Dato, Highland Park, Ill. 60035

Filed July 8, 1976, Ser. No. 703,618
Int. Cl.[2] A47C *29/00*
U.S. Cl. 5—362 **10 Claims**



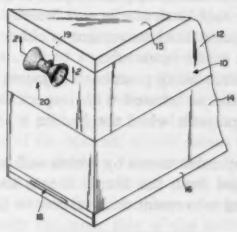
1. A bed canopy frame comprising two longitudinal members and a plurality of lateral members adapted to be interconnected adjacent the ends thereof to said longitudinal members to form a generally rectangular frame, each of said longitudinal members forming an arched side of said frame and being constructed of resilient plastic material and each of said longitudinal members having parallel top and bottom portions with a transverse portion joining said top and bottom portions, said longitudinal members being equipped with a plurality of receptacles for securing the ends of said lateral members in releasably adjustable fashion, each of said receptacles being a block integral with said transverse portion of an associated longitudinal member, said transverse portion and said block having a bore therethrough for receiving the end of an associated lateral member, said lateral members being rods and said bores being of circular cross-section with a diameter no greater than the diameter of said rods, and slot means in said blocks communicating with said bores to permit bore enlargement upon receipt of said rods.

4,074,378

AIR VENTILATOR FOR BEEHIVES

Vladimir Shaparew, R.R. No. 1, Oakville, Ontario, Canada (L6J 4Z2)

Filed Nov. 10, 1976, Ser. No. 740,744
Int. Cl.[2] A01K *47/06*
U.S. Cl. 6—1 **3 Claims**



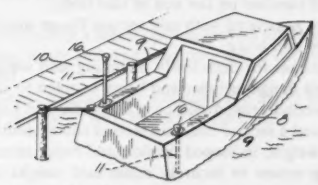
1. In combination, a hive for bees including a entrance opening for the bees and a ventilation aperture located in an upper portion of a side wall of the hive remote from and above the entrance opening so as to provide ventilation through natural air convection, and air ventilator means, mounted on the hive in communication with said ventilation aperture, for, responsive to air movement externally thereof, creating suction adjacent to said ventilation aperture so as to draw air out of said hive, and for preventing direct air flow into said ventilation aperture, said air ventilator means comprises means defining a first air passage perpendicular to the plane of the side wall in which said ventilation aperture is located and in communication with said ventilation aperture and means defining a second air passage extending transverse to said first air passage and in communication with said first air passage, said second air passage being in communication with said first air passage at a central location thereof intermediate the end portions thereof and the cross section of the end protions of said second air passage being larger than that of said central portion thereof.

4,074,379

BOARDING HANDLE FOR BOATS

Leroy W. Grossman, 74 Palm Club, Pompano Beach, Fla. 33062; Jack Collins, and E. Eugene Kohls, both of Milwaukee, Wis., assignors to Leroy W. Grossman, Pompano Beach, Fla.

Filed May 4, 1977, Ser. No. 793,746
Int. Cl.[2] B63B *17/00*
U.S. Cl. 9—1.6 **11 Claims**



1. A boarding handle securable to the gunwale of a boat to facilitate boarding and leaving the boat, comprising:

A. inner and outer substantially rigid telescoped tubes which when unrestrained are freely axially slidable relative to one another;

B. mounting means at one end of the outer tube by which it, and hence the entire handle, is securable to the gunwale of a boat with its axis substantially perpendicular to the gunwale and with the telescoped tubes projecting down through a hole in the gunwale into the space therebeneath, so that the inner tube may be moved between a lowered inoperative position substantially entirely below the

gunwale in which position only its upper end is accessible from above the gunwale, and a raised operative position projecting up from the gunwale;

C. means by which the raised operative position of the inner tube is defined, said last named means comprising

(1) latch means yieldingly projecting from the external surface of the inner tube, and

(2) keeper means fixed with respect to the outer tube to receive said latch means and thereby hold the inner tube against axial movement in either direction with respect to the outer tube,

said keeper means being positioned adjacent to said mounting means and so located with respect thereto as to be above the gunwale when the handle is secured thereto; and

D. manually operable means by which said latch means may be disengaged from the keeper means to free the inner tube for axial movement with respect to the outer tube.

4,074,380

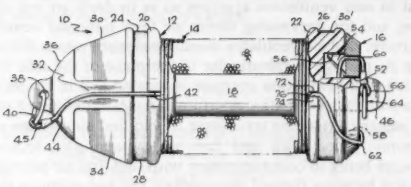
RECOVERY BUOY

David H. Parker, 336 Via Pasqual, Redondo Beach, Calif. 90277

Filed Jan. 31, 1977, Ser. No. 763,871

Int. Cl.[2] B63B *21/52, 51/02*

U.S. Cl. 9—8 R **20 Claims**



1. A recovery and marker buoy, comprising:

an enlongated body of buoyant material having axially opposite ends;

a first flange member at one of said ends;

a second flange member at the second one of said ends;

a cylindrical central spindle intermediate said first and second flange members, said flange members including opposed frusto-conical surfaces interconnecting said flange members with said spindle;

a location indicating head formed integrally with said first flange member on the axis of said body;

a weight associated with said second flange member on the axis of said body;

clamp means for detachably mounting said weight on said second flange member and being coupled to said weight;

a line wound around said central spindle and having a first end, and a second end, said second end extending through said weight, in looped fashion, and being secured to said clamp means to securely retain said weight on the line second end upon detachment of said clamp means from said second flange member and dislodgement of said weight therefrom; and

means for securing said first end of said line to said location indicating head and

means for detachably mounting said weight to said second flange, whereby upon release of said weight from said second flange member and said body, anchoring of said weight at a selected location beneath water level may be effected and said line unreels from said central spindle under the buoyant force of said body, enabling the latter to freely float to the surface of the water, in which condition said location indicating head, upon surfacing, is operable to mark a location.

4,074,381

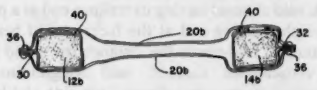
WATER SCOOTER

Ann T. Patton, 3042 Holdridge, Waukegan, Ill. 60085; Betty Ann Roscetti, 738 W. Wrightwood No. 1, Chicago, Ill. 60614, and Lisa Held, 3042 Hildridge, Waukegan, Ill. 60085

Filed Aug. 9, 1976, Ser. No. 713,016

Int. Cl.[2] A63B *31/00*

U.S. Cl. 9—310 J **1 Claim**



1. A swimming aid and water scooter apparatus comprising a pair of elongated flexibly and resiliently disposed flotation elements spatially disposed apart in general parallel relation at a distance measured by the transverse dimension of the body to use the apparatus, a sheet of waterproof canvas or plastic provided to over-wrap the pair of flotation elements to comprise a completed loop structure about said pair of flotation elements, and a selective arrangement of a plurality of grommets placed securely through the sheet into the adjacent portion of the flotation element to fix the loop structure about the flotation elements, the loop structure being provided with lacing to add resistance to the sheet so that the body is less likely to slide off the apparatus, the length of the apparatus being between one and three times of the distance the flotation elements are apart, the flotation elements being of soft, pliable, buoyant foam material covered with nylon reinforced waterproof canvas, and each of the flotation elements being constructed along a side thereof to provide an attachment strip to which the grommets are secured in rows along the length dimension of said attachment strip, said sheet of the apparatus is provideed with a slightly longer dimension of sheet on a top than on a bottom side to provide a body-receiving-surface when the apparatus is to be used, the ends of the flotation elements are covered with said nylon reinforced waterproof canvas, a Velcro fastening means is disposed on mating surfaces between the flotation elements and the sheet to provide a securing means and a cushioning means for the body using the apparatus, and a top loop of said sheet forms a hammock forming means for the body as the apparatus is used as an improved water scooter and design in serving to facilitate sensory motor integration for a user.

4,074,382

HEATING APPARATUS FOR BOOK FORMING AND CREASING IRONS

Anthony Ferdinand Palme, Avon, and Daniel Inott Streeter, Glastonbury, both of Conn., assignors to The Smyth Manufacturing Company, Bloomfield, Conn.

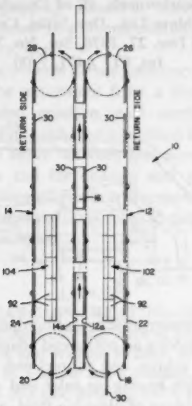
Filed Sept. 28, 1976, Ser. No. 727,433

Int. Cl.[2] B42C *19/00*

U.S. Cl. 11—1 CP **7 Claims**

1. A book forming apparatus comprising first and second endless loop carriages, means supporting the carriages for continuous synchronized movement, the carriages each having a working side, a return side and a series of book hinge creasing iron means supported on each carriage, the working sides of the carriages defining a book flow path therebetween with the creasing iron means supported for movement by their respective carriages along their working sides being in parallel spaced confronting relation for receiving and transporting a book along said book flow path between each corresponding pair of creasing iron means, and first and second stationary heating means fixed in position for heating the creasing iron means of the carriages upon movement of said creasing iron means along their respective return side upstream of their respective working side for applying a hinge crease to a book with the assistance of heat each of said first and second heating

means including a separate control means for selectively varying the energy produced and for heating the creasing iron

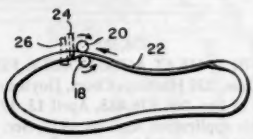


means to a desired temperature prior to its passage into the book flow path.

4,074,383
LASTING MACHINE WITH LATEX ADHESIVE DELIVERY

Martin Kaplan, Lexington, and Joseph V. Tassone, Milford, both of Mass., assignors to Compo Industries, Inc., Waltham, Mass.

Filed Mar. 17, 1977, Ser. No. 778,504
Int. Cl.[2] A43D *21/00*
U.S. Cl. 12—145 **23 Claims**



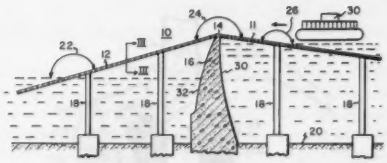
1. The method of adhesively attaching the lasting margin of an upper to the latex-receptive bottom of a shoe with latex comprising progressively and uninterruptedly stretching successive increments of the lasting margin perpendicular to the bottom with the aid of a pair of oppositely turning gripping and feeding rolls, one of which has contact with the inner side of the lasting margin and the other with the outside of the lasting margin and then releasing the pressing the margin into engagement with the bottom with the aid of wiping means, said method comprising continually delivering wet liquid latex onto the rotating surface of said one feed roll at a place substantially two-thirds of the way around from the place of stretching in the direction opposite to rotation for transfer from the place of delivery to the lasting margin at the place of stretching, directing a jet of air toward the surface of said one feed roll at a place substantially one-quarter way around from the place of stretching in the direction opposite to rotation at a pressure such as to assist in spreading the liquid latex on the surface uniformly and at a temperature such as to cause it to partially coagulate and become adhesive and, at the place of stretching, pressing the partially coagulated adhesive layer of latex in engagement with the lasting margin, said method including continuously presenting uncoated areas of the lasting margin to the place of stretching, continuously supplying fresh portions of partially coagulated adhesive latex to said incremental uncoated areas as they are advanced to said place of stretching, releasing the uncoated margin and pressing the coated margin into engagement with the latex-receptive surface of the bottom.

14. Lasting apparatus for lasting footwear with latex comprising a pair of oppositely turning work gripping and feeding rolls of oppositely tapering frustoconical configuration supported for rotation about spaced parallel axes with their frustoconical surface spaced for receiving between them the lasting margin of a shoe upper, said gripping and feeding rolls being arranged so that one of the rolls has a downwardly divergent frustoconical surface for engagement with the inner side of the lasting margin and fixed and rotating wipers at the delivery side of the gripping and feeding rolls for folding the lasting margin downwardly as it is released from the gripping and feeding rolls and for pushing the folded margin inwardly parallel to the surface of the bottom, nozzle means for gravitationally delivering wet, nontacky, nonadhesive liquid latex onto the surface of said one feed roll at a place substantially two-thirds of the way around from the place of engagement of said one feed roll, with the inner side of the lasting margin, and means for spreading and rendering said wet liquid latex partially coagulated and adhesive before it reaches said place of engagement.

4,074,384
RIVER RAMP FOR HOVERCRAFT

James D. Takacs, Rte. No. 1, Box 250, Grove, Okla. 74344

Filed Aug. 26, 1976, Ser. No. 717,572
Int. Cl.[2] E01D *1/00*
U.S. Cl. 14—1 **6 Claims**



4. Apparatus to provide for the traversal of a hovercraft over a river dam including a lock comprising:

a ramp having an upper and lower end, the upper end being upstream of the dam and the lower end being downstream of the dam, both the upper end of said ramp and the lower end of said ramp being at least partially submerged in the water;

said ramp including a raised portion located intermediate the upper and lower ends and extending above the crest of the dam; and,

support means permanently mounting the upper and lower ends of said ramp with respect to the dam.

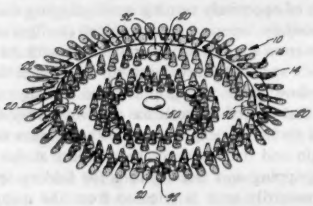
4,074,385
CARPET CLEANING BRUSH

Lawrence F. Howard, 20599 Barnard Ave., Walnut, Calif. 91789; James W. Mills, 16727 Fellowship, Valinda, Calif. 91744, and James L. Shannon, 7914 Greenbush, Van Nuys, Calif. 91402

Filed July 6, 1976, Ser. No. 703,086
Int. Cl.[2] A46B *7/08*; A47L *11/16*
U.S. Cl. 15—180 **8 Claims**

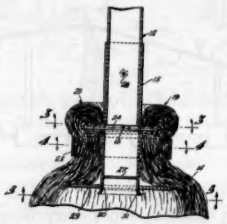
1. A brush for cleaning carpet comprising a base member; a plurality of bundles of bristles disposed about and extending from the underside of said base member, each of said bundles being spaced from the bundles adjacent thereto; and means carried by the underside of said base member for supporting

said brush, said means being (mounted for) vertically moveable with respect to said base such that said means undergoes verti-



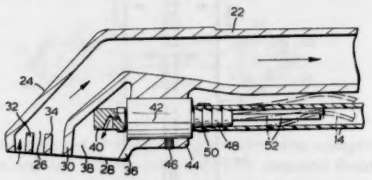
cal oscillatory motion in response to vibration of said base member.

4,074,386
ROOFING MOP
Bascom A. Drake, 7245 NW. 37th Ave., Miami, Fla. 33147
Filed Mar. 1, 1977, Ser. No. 773,433
Int. Cl.[2] A47L *13/20*
U.S. Cl. 15—229 R **1 Claim**



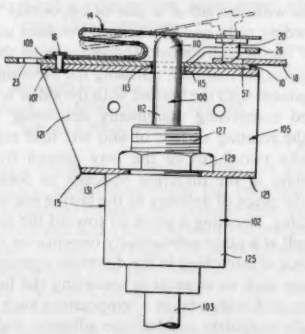
1. A roofing mop comprising, in combination, a tubular metal support member, a plurality of flexible mop strands peripherally arranged about and secured to one end portion of said tubular support member in depending relation with respect thereto, a circular spreader disc coaxially secured to said one end of said tubular support member for constraining said mop strands radially outwardly of said support member, the diameter of said spreader disc being approximately three times the diameter of said tubular support member, said spreader disc being provided with a central circular opening of substantially the same diameter as the outer diameter of said tubular metal support member, an outer portion of said one end of said tubular support member being received through said central opening, the projecting terminal end portion of said one end of said tubular support member being outwardly flared to retain said spreader disc in secured position with respect to said support member, a metal disc press-fitted within said tubular metal support member to block the passage of hot tar backwardly therethrough, said plurality of flexible mop strands comprising a plurality of doubled-over bunches of said strands, an annular wire binding member secured to said tubular support member and over which said bunches of strands are looped, and clamping band means between said wire binding member and said support disc for clamping said plurality of strands peripherally about said tubular support member.

4,074,387
VACUUM CLEANER ATTACHMENT
Paul Arato, Don Mills; Antony Lelkes, Toronto, and Larry Ronald Reid, Scarborough, all of Canada, assignors to Centaur Floor Machines Ltd., Don Mills, Canada
Filed Dec. 27, 1976, Ser. No. 754,726
Int. Cl.[2] A47L *7/00*
U.S. Cl. 15—322 **5 Claims**



1. A vacuum cleaner attachment comprising:
a first conduit having an outlet end adapted to be connected to a vacuum source, and an inlet end;
a second conduit having an inlet end adapted to be connected to a source of cleaning fluid, and an outlet end;
a valve of the outlet end of said second conduit, the valve having a manually operable operating member adapted to open and close the said valve;
an applicator head in fluid communication with the inlet end of said first conduit and the outlet end of said second conduit;
a resilient sleeve having a first longitudinal aperture receiving the first conduit, and a second longitudinal aperture receiving the second conduit, said longitudinal apertures being disposed in generally side-by-side relationship;
the operating member of said valve being disposed within said sleeve, and being manually operable in response to manual pressure exerted on a portion of the exterior of said sleeve adjacent the underlying operating member.

4,074,388
RESETTABLE, HEAT ACTUATABLE FIRE LINK
Francis J. McCabe, 239 Hastings Court, Doylestown, Pa. 18901
Continuation of Ser. No. 676,483, April 13, 1976, Pat. No. 4,041,570. This application Apr. 26, 1977, Ser. No. 791,022
The portion of the term of this patent subsequent to Aug. 16, 1994, has been disclaimed.
Int. Cl.[2] E05F *15/2*
U.S. Cl. 16—48.5 **7 Claims**



1. A resettable fire link comprising,
(a) a releasable member;
(b) gripping means associated with said releasable member for engaging said releasable member in a normal position, and for releasing said releasable member in an actuated position, said gripping means comprising at least one

mounting element and heat responsive means for causing said gripping means to move to the normal position in response to a preselected ambient temperature and for causing said gripping means to move to the actuated position in response to a preselected increase in said ambient temperature; and

(c) mechanical activation means associated with said mounting element for movement from a first withdrawn to a second extended position, said mechanical activation means in said first withdrawn position allowing said gripping means to move between said normal and said activated position and for causing said gripping means to move to the activated position in response to movement of said mechanical activation means to said second extended position.

4,074,389

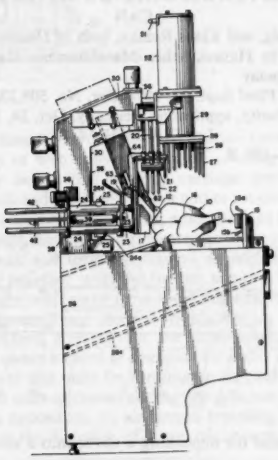
POULTRY CARCASS-TREATING APPARATUS

James M. Blair; Michael Sebring, both of Phoenix, Ariz.; Warren H. Underwood, and William P. Bley, both of Minneapolis, Minn., assignors to Armour and Company, Phoenix, Ariz.

Division of Ser. No. 382,409, July 25, 1973, Pat. No. 3,946,117, which is a division of Ser. No. 106,492, Jan. 14, 1971, Pat. No. 3,754,302. This application Aug. 18, 1975, Ser. No. 605,452

Int. Cl.[2] A22C *21/00*

U.S. Cl. 17—11 **21 Claims**



1. Apparatus for treating poultry carcass having a central notch in the forward portion thereof comprising a frame, a stop member, means for mounting and moving said stop member to a position in which it is fixed and rigid with respect to said frame, means for pressing said carcass at the rear thereof and for moving the carcass forwardly of said frame to bring said stop member into engagement with said central notch whereby said carcass is held in clamped engagement between said stop member and said pressing means.

4,074,390

FOWL GIZZARD SEPARATOR

Pieter Meyn, Noordeinde 72, Oostzaan, Netherlands

Filed Feb. 27, 1976, Ser. No. 662,205

Int. Cl.[2] A22C *21/00*

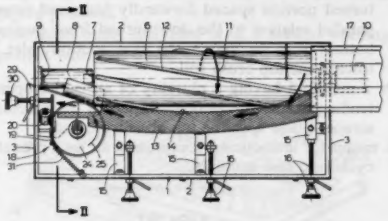
U.S. Cl. 17—11 **7 Claims**

1. Apparatus for separating the gizzard from a package of interconnected entrails removed from a fowl or the like, comprising a frame;

cutting means mounted within said frame;

supporting means mounted within said frame for supporting a gizzard while leaving the remaining entrails of said package dangling therefrom;

transport means connected with said frame for moving said gizzard towards said cutting means while said remaining entrails dangle from the supporting means; and



driving means operationally connected with said transport means and supported by said frame, said transport means cooperating with said cutting means in such manner that said remaining entrails are cut free from said gizzard by said cutting means.

4,074,391

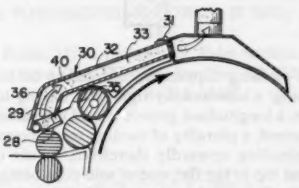
CRUSH ROLL PLENUM FOR CARDING MACHINES

Robert B. Jenkins, Jr., and Jack A. Poindexter, both of Gastonia, N.C., assignors to Jenkins Metal Corporation, Gastonia, N.C.

Filed Jan. 19, 1977, Ser. No. 760,728

Int. Cl.[2] D01G *15/82*

U.S. Cl. 19—107 **1 Claim**



1. In a carding machine having a main cylinder and a doffer cylinder, top and bottom crush rolls with scraper blades operatively associated therewith and a doffer plenum supported above the doffer cylinder, a crush roll plenum extending forwardly from the doffer plenum toward the crush rolls and comprising:

a. a suction chamber including

1. a top wall,
2. side walls depending from the top wall,
3. a bottom wall extending between the side walls of the suction chamber, and
4. a suction inlet opening toward the top crush roll,

b. means connecting said crush roll plenum to said doffer plenum for relative movement thereto into and out of operative position,

c. means establishing communication between the interior of said doffer plenum and the interior of said suction chamber when in the operative position,

d. said means for establishing communication between the interior of said doffer plenum and the interior of the suction chamber comprising a front wall in the crush roll plenum and openings in the front wall of said doffer plenum and the front wall of the crush roll plenum dimensioned to register with each other,

e. the side walls of the suction chamber extending outwardly from the front wall of the crush roll plenum and terminating in overlying relation to the top crush roll,

f. the bottom wall of said suction chamber joining the side

walls of the suction chamber at their juncture with the opening in the front wall of the crush roll plenum and extending downwardly from the opposite end portions of said side walls toward the top crush roll and terminating in closely spaced relation to the scraper blade for the top crush roll,

g. said top wall of the suction chamber including a downturned portion spaced forwardly from and extending in parallel relation to the downturned front portion of the bottom wall to define the said suction inlet opening toward the top crush roll,

h. a manifold having a plurality of air outlet openings extending axially therealong and facing the juncture of the scraper blade with the top crush roll, and

i. means for introducing compressed air on a predetermined cycle into said manifold.

4,074,392

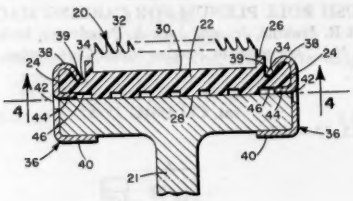
CARD CLOTHING CLIPPED TOP AND A METHOD OF MANUFACTURING THEREFOR

Alfred R. Bechtel, Jr., Portsmouth, R.I., assignor to Ashworth Bros., Inc., Fall River, Mass.

Filed July 6, 1976, Ser. No. 702,679

Int. Cl.[2] D01G *15/24*

U.S. Cl. 19—113 **6 Claims**



1. A card clothing clipped top adapted to be attached to a flat comprising: a substantially rigid base having top and bottom surfaces, a longitudinal groove in said top surface adjacent each side thereof, a plurality of carding teeth mounted on said base and extending upwardly therefrom, a pair of clips for attaching said top to the flat, one of said clips being located on one side of the flat and the other of said clips being located on the other side of the flat, each of said clips having an upper portion engaged in a corresponding one of said grooves without penetrating into said base, a lower portion adapted to be engaged with the bottom surface of the flat and an intermediate portion connecting said upper and lower portions, and a plurality of tabs provided on said intermediate portion extending inwardly therefrom to engage said bottom surface of said base without penetrating into said base to hold each of said clips thereon by a coaction between said upper portion and said tabs.

4,074,393

METHOD AND APPARATUS FOR DRY FORMING A LAYER OF FIBERS

Denis Raymond Hicklin, Bath, and Brian William Attwood, Bristol, both of England, assignors to Karl Kroyer St. Anne's Limited, Bristol, England

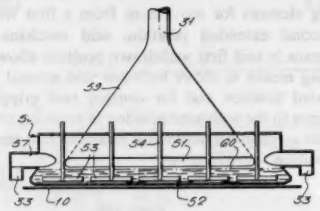
Filed Dec. 12, 1975, Ser. No. 640,219

Claims priority, application United Kingdom, Jan. 18, 1975, 02251/75

Int. Cl.[2] D04H *1/00*

U.S. Cl. 19—303 **11 Claims**

1. A method of dry forming a layer of fibers comprising the steps of conveying discrete fibers in a stream of carrier air to an inlet of a distributor housing having a fixed, perforated, bottom wall and having carrier air outlet means located above said bottom wall comprising an outlet open to atmosphere and an outlet for the removal of excess fibers; agitating the fibers to form a bed of fibers across and on top of said perforated bottom wall of the housing, said bed of fibers being formed below said carrier air outlet; and sucking fibers from the bed downwards through the bottom wall and onto a moving foraminous forming surface positioned immediately below said perforated bottom wall to form a layer of said fibers on said moving foraminous surface, whereby at least most of the carrier air which enters the housing escapes through said carrier air outlet means above the bed of fibers, and whereby the fibers pass from the bed through the fixed bottom wall of the housing to the moving forming surface under the influence of suction and gravity alone.



4,074,394

APPARATUS FOR DEPOSITING A SLIVER IN A SLIVER CAN

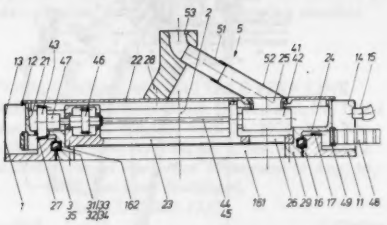
Helmut Kunig, and Klaus Reinke, both of Hamburg, Germany, assignors to Hanseatischer Maschinenbau G.m.b.H., Hamburg, Germany

Filed Sept. 12, 1974, Ser. No. 505,233

Claims priority, application Germany, Oct. 24, 1973, 2353889

Int. Cl.[2] B65H *54/80*

U.S. Cl. 19—159 R **2 Claims**



1. Apparatus for depositing a sliver into a sliver can, comprising

a support having an upwardly directed surface provided with a first annulus of gear teeth;

an anti-friction bearing mounted on said support for rotation in a substantially horizontal plane;

a coiler plate journalled in said bearing for rotation about an upright axis,

said coiler plate having a circumferential rim which carries a second annulus of gear teeth located substantially in said plane, and also being provided with a sliver discharge opening eccentric to said axis;

a pair of cooperating feed rollers mounted above said opening for rotation with said coiler plate,

said feed rollers defining with one another a nip above said discharge opening;

guide means for guiding a sliver to said nip from above said feed rollers,

said guide means comprising a holder on said coiler plate rotatable therewith and having a nozzle coaxial with said axis of rotation,

a tubular socket inclined to said axis and extending from said nozzle towards said nip,

and a tubular member slidably telescoped onto said socket

and movable to an extended position in which a free end of said tubular member is located above said nip, and a retracted position in which said free end is retracted laterally and upwardly of said nip so as to afford access thereto;

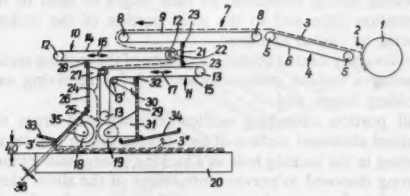
and drive means for said feed rollers, including a rotatable gear coaxial with said first annulus, and a toothed drive belt located substantially in said plane and surrounding said second annulus so that, when motion is imparted to said belt, the belt rotates said coiler plate substantially without vibration due to the location of said belt relative to said plane.

4,074,395

WEB LAYERING DEVICE

Werner Frosch, Beckedorf, and Wolfgang Uliczka, Bremen, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Nov. 9, 1976, Ser. No. 740,213
Claims priority, application Germany, Nov. 19, 1975, 2551898
Int. Cl.[2] B65H *45/103*
U.S. Cl. 19—163 **12 Claims**



1. In a machine for layering a web of textile fibers, composed of a plurality of web conveying units including a stationary web delivery unit, a first layering carriage unit mounted to undergo a back and forth movement and to receive a fiber web from the delivery unit, a further layering carriage unit disposed in sequence with the first layering carriage unit and mounted to undergo a back and forth movement, an additional layering unit movable together with the further layering carriage unit for conveying a web away from the further layering carriage unit, and a transporting unit for transporting a layered web from the additional layering unit, the improvement comprising air guidance means located at a region of transfer of such a web between two of said units for forming an air guidance channel with said two units to create, during conveyance of a web in a web layering procedure, an air stream traveling substantially tangentially to the direction of travel of the web.

4,074,396

CLASP WITH ENCLOSED PIN

Ronald N. Swimley, Phoenix, Ariz., assignor to Siron Industries, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 567,183, April 11, 1975, abandoned. This application Sept. 27, 1976, Ser. No. 727,298
Int. Cl.[2] A44B *9/00*
U.S. Cl. 24—162 **2 Claims**

1. A U-shaped clasp for engaging between its legs material to be held together comprising:

an elongated body member formed in a U-shaped configuration to define a pair of juxtapositioned legs connected together at a common end,

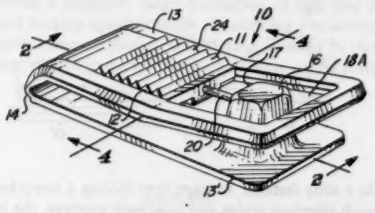
a track comprising a tongue and a first groove formed along the outer surface of one of said legs for accepting a member slidable therealong, said tongue and first groove extending along the length of said one of said legs,

said one of said legs being provided with a first opening adjacent its free end,

a slide member mounted for slidable movement along said track and being provided with a second groove configured for receiving and interlocking with said tongue of said track for preventing lateral movement of said slide member relative to said track, whereby movement of said slide member along said track frictionally restrains said slide member along the full length of said track,

a dome shaped protrusion extending from the inner surface of said other leg of said body member for penetrating said first opening in said one of said legs when in a material engaging position,

said protrusion being provided with a second opening in alignment with said track,



the outside surface of said slide member being ridged to aid in moving the slide member along the track and said slide member being provided with a pin for penetrating said second opening when moved toward said protrusion,

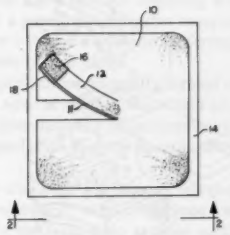
whereby material to be gripped by said clasp forced between the common ends of said body member and over said protrusion is wedgingly engaged between said slide member and said other leg and penetrated by said pin as it moves into said protrusion.

4,074,397

DEVICE FOR SECURING CORDS, TUBES, AND THE LIKE

Stanley A. Rosin, 115 S. Indian Ave., Palm Springs, Calif. 92262

Filed Oct. 15, 1976, Ser. No. 732,725
Int. Cl.[2] A61M *25/02*
U.S. Cl. 24—73 AS **3 Claims**

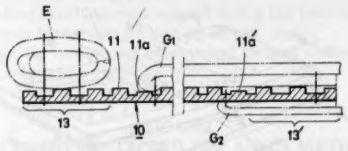


1. A device for securing cords, tubes and the like to a supporting surface comprising: a flexible fabric pad and having a pressure-sensitive adhesive layer on one surface thereof; an elongated flexible fabric strip member formed as a cut-out portion of said pad also having the pressure-sensitive adhesive layer on one surface thereof, said strip member having one end integral with said pad and having a distal end; a first tab having a multiplicity of minute hook members formed thereon, said first tab being affixed to the distal end of said strip member on one side thereof; a second tab having a multiplicity of minute hook members formed thereon, said second tab being affixed to the distal end of said strip member on the other side thereof; said flexible fabric being a material capable of receiving the hook members of the tabs in fastening relationship therewith when the tabs are selectively pressed against the pad after the strip member has been looped around a tube, cord, or the like, to be secured by the device.

4,074,398
SLIDE FASTENER TAPE

Yoshio Matsuda, Nyuzen, and Yoshitoki Tsubokawa, Kurobe, both of Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Sept. 17, 1975, Ser. No. 613,997
Claims priority, application Japan, Sept. 27, 1974, 49-117522
The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.
Int. Cl.[2] A44B *19/12*
U.S. Cl. 24—205.1 C 3 Claims

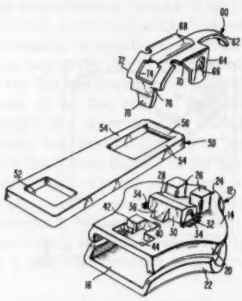


1. In a slide fastener stringer tape having a warp-knit structure with alternate wales and interwale grooves, the improvement comprising chain stitches, tricot stitches, warp threads and additional stitches transversely spanning a plurality of wales, defining in the tape a web portion and at least one marginal edge portion adjoining said web portion, said marginal edge portion having a wale of lesser height than the other wales of such marginal edge portion, said wale of lesser height being constituted solely by some of said tricot stitches and some of said additional stitches and defining a guide path for sewing stitches.

4,074,399
SLIDER FOR SLIDE FASTENER

Stanley G. Kedzierski, Saegertown, Pa., assignor to Textron, Inc., Providence, R.I.

Filed Nov. 8, 1976, Ser. No. 740,006
Int. Cl.[2] A44B *19/30*
U.S. Cl. 24—205.14 R 6 Claims

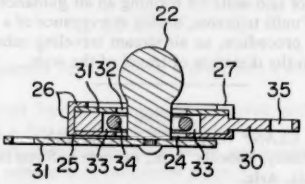


1. A slider for a slide fastener comprising in combination,
a slider body having upper and lower spaced parallel wings joined by a connecting post,
said upper wing having formed on the top surface thereof a spring groove extending forward to the connecting post,
a pair of upstanding lugs disposed on opposite sides of a longitudinal center line of the slider body and adjacent the spring groove formed on the top surface of the upper wing,
a spring support disposed on the upper wing adjacent the pair of upstanding lugs and having a boss disposed on a vertical surface thereof, said boss having a cam surface defined by a steep ramp-like triangular extension,
said spring support having retention means in opposite end surfaces thereof,
cut-out slots disposed in the upper wing adjacent each of said retention cavities,
a spring holding finger extending upward and rearward from the upper wing and defining a rear cam surface along a surface thereof, said rear cam surface being positioned to face said ramp-like triangular extension,
said spring holding finger extending over a locking hole provided through the upper wing,
a pull tab having a pair of extending pull arms formed along an end thereof and joined by a cross bar extending therebetween, said cross bar being disposed for co-operating movement between said rear cam surface of the spring holding finger and the said ramp-like triangular extension of the spring support,
a locking spring having a plate-like body with an elongated and downwardly curved projection extending to the spring groove from its front end and having a pair of downwardly extending retention arms formed midway along its sides, said retention arms being positioned each in a cut-out slot and having retaining tabs bent inwardly and disposed for engagement within said retention means of the spring support,
sloped abutment surfaces provided on the bottom of the locking spring connected to back edges of each of the retention arms and to the main portion of the locking spring by canted surfaces,
a downwardly canted abutment surface of the locking spring having a cut-out portion positioned for receiving said holding finger, and
a tail portion extending vertically downward from the canted abutment surface of the locking spring and terminating in the locking hole as a locking prong, said locking prong disposed to prevent movement of the slider along the slide fastener when in normal position whereby any pulling of the pull tab lifts the locking prong to free the slider for movement.

4,074,400
FASTENINGS SUITABLE FOR PERSONAL ORNAMENTS

Nisuke Sekiguchi, Tokyo, Japan, assignor to Sekiguchi Seisakusho Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1977, Ser. No. 775,426
Int. Cl.[2] A44G *17/00*
U.S. Cl. 24—218 1 Claim



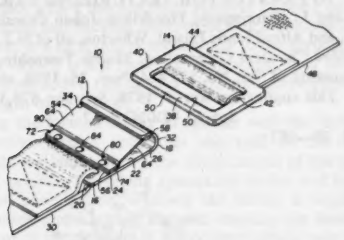
1. A fastening suitable for a personal ornament, which comprises a male member (A) and a female member (B); the male member (A) including a base plate **21** on which a projecting portion **22** is provided; the female member (B) including a casing **23** which has a base plate **25** and an upstanding edge **26** formed by bending a marginal portion of the base plate **25**; the base plate **25** having an opening **24** which can receive the projecting portion **22**; the upstanding edge **26** having an opening **27** through which an ornament-fitting portion **30** of a ring plate **28** may be projected outwards; the ring plate **28** having an opening **29** whose diameter is larger than that of the opening **24** of the base plate **25**; the ring plate **28** having the ornament-fitting portion **30** in the form of an projection; the ring plate **28** being placed in the casing **23** in such a manner that the ornament-fitting portion **30** projects through the opening **27**; a

ring-like cover plate **31** being placed on the upper surface of the ring plate **28**; the cover plate **31** having an opening **32** whose diameter is virtually the same as that of the opening **24** of the base plate **25**; a partially opened annular spring **34** being placed on a recess channel which is defined by the upper surface of the base plate **25** of the casing **23**, by the internal wall of the ring plate **28**, which wall surrounds the opening **29**, and by the lower surface of the ring-like cover plate **31**, whereby the spring **34** is disposed on the recess channel in such a position that an internal portion of the spring **34** is present in an inner area of the openings **24** and **32**; the upstanding edge **26** of the casing **23** being bent inwards to fix the ring-like cover plate **31**.

4,074,401
SNAP ASSEMBLY

Dominic J. Spinosa, Wantagh, and Frank Knoll, Huntington Sta., both of N.Y., assignors to East/West Industries, Inc., Farmingdale, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,320
Int. Cl.[2] A44B *13/02*
U.S. Cl. 24—236 **18 Claims**



1. A snap assembly adapted to receive a cooperating buckle element, said snap assembly comprising:

A. a base having oppositely disposed front and rear ends, with upper and lower surfaces intermediate said ends, and spaced apart sides extending between said front and rear surfaces,

B. a hook integrally formed with said front end of said base and extending inwardly in the direction of said rear end and terminating in a distal end,

C. said hook having an inner surface bounding one side of said hook facing said upper surface of said base for forming an enclosure for receiving the buckle element therein,

D. a flexible locking member adapted to be moved relative to said inner surface of said hook, said locking member having an outer end and an oppositely disposed free end, with spaced apart sides intermediate said ends, said outer end formed by a wall having one surface thereof extending in overlapping relationship with and secured to said base, the width of said base and said locking member as defined respectively by each of said spaced apart sides being substantially equal to each other,

E. load distribution means extending in overlapping relationship to the oppositely disposed surface of said wall, said load distribution means including a plate extending transversely between said spaced apart sides of said base and said locking member,

F. coupling means for securing said base, said wall, and said plate to each other, such that any load on said wall is distributed across said plate, said coupling means comprises a plurality of spaced apart fasteners,

G. resilient means for continuously urging said free end of said locking member into abutting pressural engagement with said inner surface of said hook and being movable toward and away from said inner surface, and

H. said resilient means comprising

1. a rib integrally joined by an arcuate configuration at one end thereof with said wall and extending upwardly therefrom,

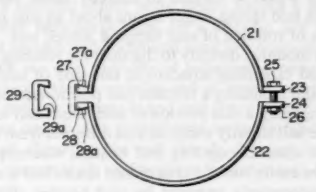
2. a clip integrally joined by an arcuate configuration at one end thereof with the other end of said rib, said arcuate configurations each being in the form of radii that are substantially conformal to each other with said clip terminating in said free end of said locking member and inclined upwardly relative to said base for movement relative thereto, and

3. said movement of said locking member providing an angle of deflection in said clip and in said rib so as to obtain a relatively large translation of said free end of said locking member while maintaining a relatively low stress concentration in said locking member by distribution of said stress in each said arcuate configuration.

4,074,402
PIPE CLAMP

Osamu Taketani, Tokyo, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Sept. 19, 1975, Ser. No. 615,083
Claims priority, application Japan, Sept. 25, 1974, 49-109604
Int. Cl.[2] B65D *63/00*
U.S. Cl. 24—268 **2 Claims**



1. A pipe clamp apparatus for clamping around the outer circumference of a pipe, said apparatus comprising:

a plurality of arc-shaped bands circumferentially surrounding the outside of said pipe;

first clamping projections integrally formed on the opposing longitudinal sides of at least two of said arc-shaped bands, each of said first clamping projections having a hole therethrough aligned with the hole through the other clamping projection;

paired second clamping projections integrally formed on opposing longitudinal sides of at least two of said arc-shaped bands and extending at least partially along the length of said sides, each pair of said projections slanting outwardly away from the outer longitudinal surface of said bands at straight angles thereto and each projection being slanted in a direction opposite to the direction of the opposing projection of said pair of projections, each of said slanted projections having a slanted surface extending outward from said arc-shaped band and the longitudinal direction of said slanted surface being parallel to the longitudinal axis of said pipe surrounded by said arc-shaped bands;

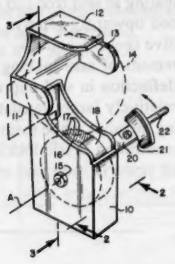
removable clip means having a groove therein, said groove having straight longitudinal sides formed at the same angles as said slant surfaces, fitted over each pair of said second clamping projections for tightly holding said slant surfaces of said second clamping projections therein; and

bold and nut means fitted through said aligned holes in said first clamping projections for attaching and forcing said first clamping projections toward each other.

4,074,403
TENNIS BALL NAPPER

Clifton Martin Jones, 844 10th St., Santa Monica, Calif. 90403

Filed Dec. 22, 1976, Ser. No. 753,439
Int. Cl.[2] D06C *11/00*
U.S. Cl. 26—29 R 7 Claims

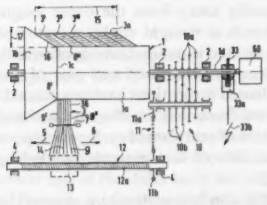


1. A tennis ball napper including, in combination:
(a) an open frame structure having spring finger means for lightly gripping a tennis ball;
(b) a napping wheel;
(c) a shaft to which said napping wheel is secured, mounted in the frame for rotating said napping wheel in a plane including the center of said tennis ball, the periphery of said napping wheel including radially extending bristles successively engaging the nap on said ball when said napping wheel is rotated to thereby cause said ball to rotate in said spring finger means about an axis parallel to the axis of rotation of said napping wheel; and
(d) means mounted directly to the shaft for rotating with said shaft and extending adjacent to one side of said napping wheel and including a friction pad positioned for periodically engaging a side portion of said tennis ball to thereby turn the ball slightly about an axis different from its axis of rotation when engaged by said bristles, whereby substantially the entire surface area of said tennis ball is automatically successively engaged by said bristles after several rotations of said napping wheel.

4,074,404
APPARATUS FOR CONTROLLING APPLICATION OF WARP SECTIONS DURING WARPING

Kurt Schenk, Degersheim, Switzerland, assignor to Maschinenfabrik Benniger AG, Uzwil, Switzerland

Filed Apr. 21, 1977, Ser. No. 789,545
Claims priority, application Switzerland, Apr. 23, 1976, 5124/76
Int. Cl.[2] D02H *13/26*
U.S. Cl. 28—185 8 Claims

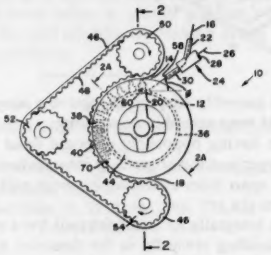


1. In an apparatus for controlling the application of warp sections during a warping operation, wherein a winding of predetermined length of warp threads and application height is exposed to a warping operation wherein successive threads withdrawn from the bobbins of a bobbin creel and each delivered by means of a stop motion and thread brake to a warping reed are formed at that location into a warp section upon a winding drum of a winding machine, the improvement comprising:
means for calculating at any point in time a theoretical, momentary reference-application of the wound-up warp sections on the basis of fixed data inherent to the material undergoing warping and the number of revolutions of the winding drum;
means for measuring at the same time the actual-application of the warp sections; and
means for comparison of the calculated momentary reference-application with the measured momentary actual-application at such point in time and for generating a signal in the presence of deviations, which signal brings about a correction by adjusting the thread tension of the thread withdrawn from the creel.

4,074,405
APPARATUS FOR TEXTURIZING YARN

Hsin Lang Li, Parsippany; Hendrikus Johan Oswald, Morristown, and Alfred Louis Liland, Wharton, all of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation of Ser. No. 527,464, Nov. 26, 1974, abandoned.
This application Apr. 9, 1976, Ser. No. 675,353
Int. Cl.[2] D02G *1/12*
U.S. Cl. 28—257 8 Claims

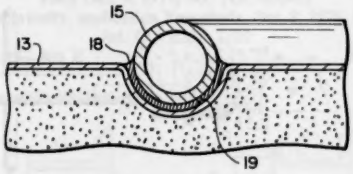


1. Apparatus for crimping a tow of continuous filaments comprising:
a. a chamber having an inlet opening for receiving the filaments, and an outlet opening for withdrawing the filaments;
b. a movable perforate yarn-receiving means at least partially disposed in said chamber adjacent said inlet opening;
c. fluid directing means having an angular disposition relative to said yarn-receiving means for directing a stream of compressible fluid containing said filaments into contact with said yarn-receiving means to initiate crimping thereof, the angle of disposition ranging from about 15° to 75° and being such that impingement of said filaments on said yarn-receiving means occurs within said chamber; said yarn-receiving means being adapted to separate the major portion of said fluid from said filaments and to expel it from said chamber and to provide a continuously moving surface associated with said chamber, the velocity of said surface being adjusted to cause overfeeding of said filaments into said chamber, the ratio between the velocity of said filaments and the velocity of said surface and the angular disposition of said fluid directing means being such that said filaments are initially crimped by impact against said surface and deflected therefrom against a mass of said tow to produce final crimping of the filaments, and emerge from the chamber in crimped form.

4,074,406
METHOD FOR MANUFACTURING SOLAR ENERGY COLLECTORS

John B. Boyd, 177 Hemlock Court, Palo Alto, Calif. 94306, and Norman E. Rees, 334 Hawthorne Ave., Palo Alto, Calif. 94301

Filed June 25, 1976, Ser. No. 699,692
Int. Cl.[2] B23P *15/26*
U.S. Cl. 29—157.3 C 10 Claims

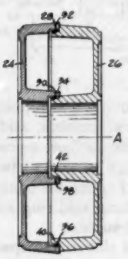


1. A method for fabrication of radiant heat collector panels comprising:
   a. forming thermally conductive tubing into a desired shape pattern;
   b. placing a thin, thermally conductive lamina permanently in contact with a mechanically resistive backing material, said lamina and backing material having a combined yield strength, in a direction perpendicular to the surface of the lamina, which is less than the yield strength of the thermally conductive tubing in a direction perpendicular to the length of the tubing;
   c. placing the formed tubing in contact with the thermally conductive lamina such that the wall of the tubing contacts the lamina along the entire length of the tubing; and, d. pressing the tubing against the lamina and backing material combination, whereby the tubing is urged into the lamina and backing material causing the lamina to conform to the contour of the copper tubing over a substantial portion of the surface of the tubing.

4,074,407
METHOD FOR MAKING A HOLLOW-BODIED CASTER WHEEL

Carl O. Christensen, Alamo, Calif., assignor to Roll-Rite Corporation, Oakland, Calif.

Filed Mar. 17, 1977, Ser. No. 778,486
Int. Cl.[2] B21D *53/26*
U.S. Cl. 29—159 R 2 Claims

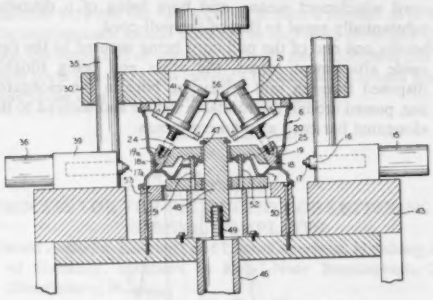


1. A method of making a hollow-bodied caster wheel from castings forming an outer and an inner wheel body half respectively, each said half having generally cylindrical flanges coaxial with the axis of said wheel, the inner surface of said flanges on said outer half being slightly closer to said axis than the outer surface of said flanges on said inner half when said halves are at the same temperature, comprising the steps of:
   a. causing said inner half to assume a sufficiently low temperature and said outer half to assume a sufficiently high temperature to cause said outer surface to be closer to said axis than said inner surface;
   b. placing said flanges of said outer half axially over said flanges of said inner half while said halves are at said differing temperatures; and
   c. allowing said halves to assume equal temperatures.

4,074,408
METHOD FOR MAKING VEHICLE WHEEL ASSEMBLY

Dalton M. Davis, Clayton, Calif., assignor to FDI, Inc., Cleveland, Ohio

Filed June 21, 1976, Ser. No. 698,420
Int. Cl.[2] B21H *1/02;* B21K *1/32*
U.S. Cl. 29—159.01 11 Claims



1. A method for manufacturing a wheel assembly by fixedly attaching a metallic center body means having a hub portion and an outer peripheral band, to a metallic tire rim means juxtaposed around said peripheral band in a concentric manner through the use of a plurality of telescoping protruberances, each of which extends radially and at which indentation and nesting of said tire rim means and said outer band of said center body means occurs, said protruberances being fabricated by a plurality of aligned male and female forming tool means, which co-operate with tool support fixture means comprising the steps of:
   forcing and maintaining said center body means within said tire rim means in an interference fit so that said tire rim means is closely juxtaposed to said outer peripheral band of said center body means through said tool support fixture means;
   firmly located and positioning said plurality of female forming tool means along the interior circumferential perimeter of said outer peripheral band so as to abut a portion of said female forming tool means between said interior circumferential perimeter and said tool support fixture means to maintain said female forming tool means in an aligned restrained position with respect to said male tool means and said wheel assembly during actuation of said male tool means;
   forcing said respective plurality of aligned male forming tool means, positioned on the outside of the tire rim means, into said tire rim means and in turn said center body means towards and into said female forming tool means so as to dimple a portion of said tire rim means into said outer peripheral band of said center body together, thereby forming said protruberance; and
   withdrawing said plurality of male forming tool means from the region of said formed protruberance.

4,074,409
COMPOUND BOW STRING CHANGER

Jimmie T. Smith, 6737 E. 5th Place, Tulsa, Okla. 74112

Filed May 4, 1976, Ser. No. 683,166
Int. Cl.[2] B23P *19/02*
U.S. Cl. 29—235 8 Claims

1. A bow stringing apparatus comprising:
   a. an elongated flexible pull cord being adjustable in length

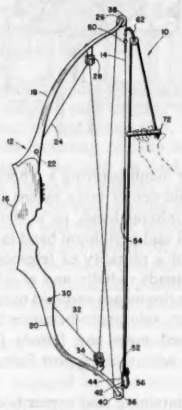
to provide a cord length longer than the distance between cable ends of a compound bow when a bow is strung but shorter than twice said distance and having a substantially uniform diameter;

b. a first cable attachment means removably attachable to one cable end between an associated bow string support and its associated eccentric pulley;

c. a second cable attachment means removably attachable to an opposite cable end between an associated bow string support means and its associated eccentric pulley, a rotatable sheave carried by the second cable attachment means;

d. an elongated bar having cord attachment means at one end and a transverse bore therethrough spaced from the cord attachment means, said bore being of a diameter substantially equal to that of the pull cord;

whereby one end of the pull cord being secured to the first cable attachment means, the other end being slidably disposed through said transverse bore in the elongated bar, passed around the rotatable sheave and secured to the elongated bar cord attachment means.



7. A method for changing a bow string of a compound bow by means of a tent cord type tightening apparatus and comprising the steps of;

a. attaching a first attachment means to one compound bow cable end;

b. attaching a second attachment means to an opposite compound bow cable end;

c. orienting a pull bar perpendicular to a bow string of a compound bow and pulling the pull bar along a pull cord until a compound bow is compressed thereby relaxing a bow string;

d. orienting the bar substantially parallel to a bow string thereby locking a bow under compression;

e. removing and replacing a bow string from a bow string support;

f. reorienting the bar perpendicular to a bow string and relaxing tension thereby transferring tension to a bow string;

g. removing the tightening apparatus.

4,074,410

LOCK EXTRACTOR

Robert L. Jarm, Buffalo Grove, Ill., assignor to Credit Industry Associates, Inc., Arlington Heights, Ill.

Filed Dec. 30, 1975, Ser. No. 645,321
Int. Cl.² B23P *19/04*
U.S. Cl. 29—265 **10 Claims**

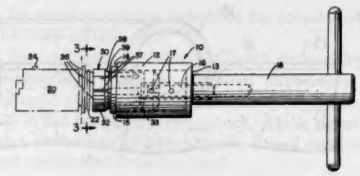
1. A device for extracting the lock from a lock assembly, said device comprising:

a collar having an end surface adapted to engage the lock assembly, said end surface having an inner cam edge;

a threaded shaft positioned within said collar having at one end a handle which bears against said collar;

a collet slidably positioned within said collar having an internally threaded portion which engages said threaded shaft; and

a plurality of outwardly biased spring teeth having inwardly projecting engaging portions formed on said collet which surround and loosely engage the lock when said collet is



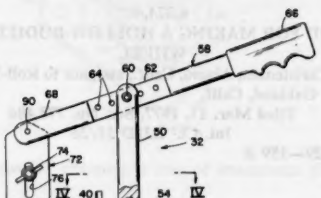
in an extended position wherein the ends of said teeth protrude beyond said collar and said spring teeth having an outer cam surface for engagement with said inner cam edge of said surrounding collar thereby urging said spring teeth to tighten about said lock when the collet is withdrawn within said collar, whereby the turning of said handle will cause the collet to withdraw completely within said collar and thereby extract said lock from the lock assembly.

4,074,411

RING REMOVING WRENCH

David A. Willard, 545 Elder Court, San Jose, Calif. 95123, and Raymond W. Thomas, 1369 Lexington Drive, San Jose, Calif. 95117

Filed Apr. 29, 1977, Ser. No. 792,148
Int. Cl.² B23P *19/08*
U.S. Cl. 29—267 **13 Claims**



1. Apparatus for removing and replacing a ring which fits tightly about a cylindrical member, said member proceeding away from a generally flat surface, a generally circular flange proceeding from a portion of said surface located outwardly radially of said ring; said apparatus comprising:

a sleeve sized to fit about said ring with a first end of said sleeve adjacent said surface;

means carried by said sleeve and spaced circumferentially thereabout for engaging a first end of said ring, said first ring end being adjacent said surface;

means for selectively positioning said first ring end engaging means in and out of engagement with said first ring end;

a support extending from a second end of said sleeve away from said surface;

a lever;

means for pivotally attaching a central portion of said lever to said support; and

means attached adjacent an end of said lever for engaging with said flange whereby on pivoting of said lever to cause said flange engaging means to exert a force on said flange towards said surface, said first end ring engaging

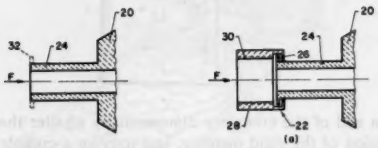
means move said ring away from said surface and remove said ring from said cylindrical member.

4,074,412

METHOD OF REPAIRING OR REINFORCING TUBULAR PLASTIC MEMBERS

Franjo Miskic, Gajeva UL. 23, Hrvatska, 41000-Zagreb, Yugoslavia

Filed Oct. 4, 1976, Ser. No. 729,455
Claims priority, application Yugoslavia, Oct. 8, 1975, 2568/75
Int. Cl.² B23P 7/00
U.S. Cl. 29—401 E 3 Claims



1. A method of repairing a plastic hose connector including a tubular member having an outer end portion which originally included an outwardly projecting annular lip retaining a captive nut, the method comprising the steps of:

(a) applying to the member under the action of heat, a metal sleeve which is of a shape and size selected to closely fit and make surface-to-surface contact with the tubular plastic member at the region thereof to be repaired, the sleeve having an outer end which includes a lip simulating said lip of the tubular plastic member and retaining a captive nut, the sleeve being heated to a temperature sufficient to cause melting of the surface of the member where it contacts the metal sleeve, and the sleeve being applied to the member in a position such that the lip and nut of the sleeve replace the corresponding original parts of the hose connector; and,

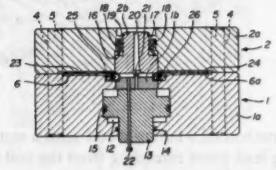
(b) abruptly cooling the plastic member and sleeve.

4,074,413

METHOD AND APPARATUS FOR MANUFACTURING SEPARABLE SLIDING CLASP FASTENERS

Riccardo Taccani, Via Civitali 50, 20148 Milan, Italy

Filed Jan. 14, 1977, Ser. No. 759,572
Claims priority, application Switzerland, Jan. 22, 1976, 792/76
Int. Cl.² B21D 53/50; B29D 5/00
U.S. Cl. 29—408 2 Claims



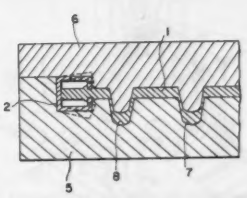
1. In a method of manufacturing separable sliding clasp fasteners, from a continuous fastener comprising two halves each formed of a continuous support-strip carrying a continuous row of interlocking elements made of thermoplastic material, each separable fastener comprising a separating device formed of one female part and two male parts, one on each of the fastener halves and one of which is displaceable in the female part, a top stop on each of the halves, and a sliding clasp, the movement of which in opposite directions respectively provides locking and unlocking of the two rows of interlocking elements, the improvement which comprises said two male parts of one fastener, the two top stops of another fastener, support-strip reinforcements along the male parts and said stops, and an opening for introducing a sliding clasp, are simultaneously prepared by introducing a section of each of the two uncoupled and spaced halves of a continuous fastener into a mold in such a manner that the support-strip of each section is placed above two strip-reinforcement imprints arranged in the mold one behind the other at a distance greater than the length of the sliding clasp, and that the row of interlocking elements is placed in a channel traversing the mold and formed from two partitions, each of said partitions being adjacent to one of the two opposite ends of the imprints; injecting melted thermoplastic material into the mold; permitting the injected material to solidify, and then cutting the solidified material between the two sections in such a manner as to form the two opposite lateral sides of the two male parts and of the two top stops, and an opening between said male parts and said male parts and said stops having a breadth and a length greater than those of a sliding clasp to be introduced.

4,074,414

PROCESS FOR THE PRODUCTION OF LETTERING OR SYMBOL TEMPLATES

Gerold Anderka, Ellerbek, and Lasse Kuparinen, Hamburg, both of Germany, assignors to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed July 9, 1976, Ser. No. 703,876
Claims priority, application Germany, July 11, 1975, 2531051
Int. Cl.² B29C 17/02, 17/10, 27/00
U.S. Cl. 29—509 6 Claims



1. A process for the production of a lettering or symbol template having at least one symbol cut out and at least one template strip on a longitudinal edge thereof, comprising:

A. inserting a sheet of thermoplastic material, together with at least one template strip having free edges positioned to extend around a longitudinal edge of said sheet, between a punch part and a matrix part;

B. penetrating said sheet with said punch, to force at least one portion of said sheet out of the plane of sheet while leaving said portion attached to said sheet by thin connecting areas of connecting material; while simultaneously

C. pressing the free edges of said at least one template strip around a longitudinal edge of said sheet so as to penetrate said free edges into said thermoplastic material; and

D. separating said at least one forced out portion by severing said thin connecting areas, thereby defining said template.

4,074,415

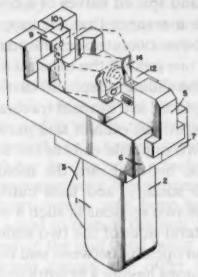
FIBER OPTIC SEAL ASSEMBLY

Lorin R. Stieff, P.O. Box 263, Kensington, Md. 20795

Filed Feb. 14, 1977, Ser. No. 768,435
Int. Cl.² B25B 27/02
U.S. Cl. 29—520 20 Claims

13. A method for assembly of a fiber optic seal comprising stripping a predetermined length of sheath from and end of a fiber optic bundle and exposing the fibers, inserting the

stripped fibers in a seal block and inserting the block in a retainer, moving an anvil toward a collet in the block in which



ends of the stripped fibers are held and securing the collet in the block.

4,074,416

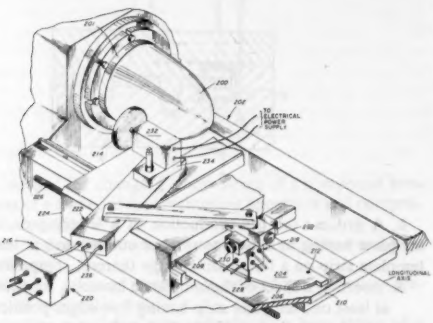
MIRROR AND METHOD OF MAKING SAME

Werner R. Rambauske, Carlisle, and John J. Grabowski, Andover, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 463,697, April 24, 1974, which is a continuation-in-part of Ser. No. 268,271, July 3, 1972, Pat. No. 3,841,737. This application Sept. 13, 1976, Ser. No. 722,844

Int. Cl.[2] B22D *11/26*

U.S. Cl. 29—527.4 **2 Claims**



1. The method of fabricating a blank for a mirror comprising the steps of:

(a) casting a base from an alloy of nickel (35%) and iron;

(b) machining a surface of the base to correspond with the desired contour of the mirror;

(c) applying, in a plasma jet, a coating of tungsten carbide to the machined surface of the base; and

(d) grinding the coating of tungsten carbide to correspond with the desired contour of the mirror.

4,074,417

METHOD OF SEALING ELECTRICAL HOUSING

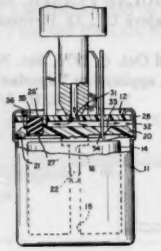
Godfrey R. Pearce; William J. Breeden, and Francis R. See, all of Glasgow, Ky., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation of Ser. No. 504,367, Sept. 9, 1974, abandoned. This application Apr. 5, 1976, Ser. No. 673,495

Int. Cl.[2] H05K *5/03*

U.S. Cl. 29—570 **5 Claims**

1. A method of making an electrical device comprising the steps of providing a container having an open end, placing in the container an electrical body having receptacles at each end thereof, positioning a disc-like member having a positioning means adjacent to the electrical body and the open end of the container to thereby project the positioning means into the receptacle of the electrical body, positioning a rigid member adjacent to the disc-like member, making the extremity at the



open end of the container dimensionally smaller than the dimension of the rigid member, and moving a curable material between the disc-like member and the rigid member to occupy a volume between the members and contact side walls of the container and thereby close the container.

4,074,418

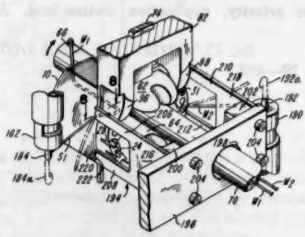
STATOR COIL WINDING AND LEAD WIRE CONNECTION

Harold I. Pearsall, Centerville, Ohio, assignor to The Globe Tool and Engineering Company, Dayton, Ohio

Filed July 23, 1976, Ser. No. 708,190

Int. Cl.[2] H02K *15/095*

U.S. Cl. 29—596 **12 Claims**



1. In a method of winding a coil onto a stator core and for connecting lead wires extending from the coil into slots in one or more terminal boards mounted on the stator core, the steps comprising:

a. at the end of the winding of a coil by a shuttle, stopping the shuttle movement adjacent one end of the stator core,

b. engaging the section of wire between the coil and the shuttle and moving said section to one side of the stator core,

c. guiding said section into alignment with one of said slots,

d. inserting said section into said one of said slots,

e. clamping the wire portion between said one of said slots and the shuttle, and

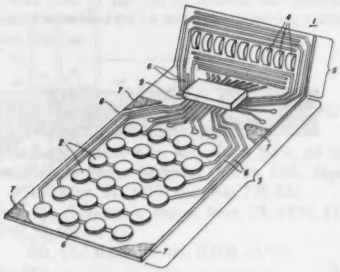
f. cutting the wire portion between the clamped portion thereof and said one of said slots.

4,074,419

PRINTED WIRING BOARD WITH ANGLED PORTION AND ITS METHOD OF MANUFACTURE

Stephen L. Hanni, Richardson, and Dudley B. Johnson, Irving, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 16, 1976, Ser. No. 667,333
Int. Cl.[2] H05K 3/00
U.S. Cl. 29—625 10 Claims



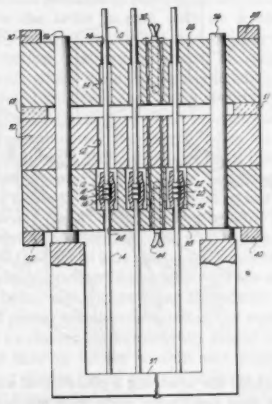
1. A method of manufacturing a printed wiring board with an angled portion comprising:
(a) forming a metal substrate;
(b) coating the metal substrate with an insulating material;
(c) additively forming a plurality of conductors on the insulating material after the step of coating said substrate; and
(d) bending the insulated metal substrate and at least one conductor formed thereon, thereby causing the insulated substrate to occupy at least two major planes.

4,074,420

METHOD AND APPARATUS FOR THE ASSEMBLY OF JACKETED ELECTRONIC DEVICES

Clyde A. Lofdahl, Los Altos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Aug. 5, 1976, Ser. No. 712,037
Int. Cl.[2] H01R 43/02
U.S. Cl. 29—628 18 Claims



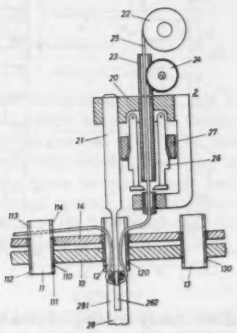
1. A method for assembling electronic devices, including the steps of
loading the heating chambers of a first heating block with leads and electronic components;
loading the heating chambers of a second heating block with jackets for electronic components;
positioning the second heating block above the first heating block and aligning the heating chambers of each heating block;
heating the first heating block with the leads and electronic components positioned therein to fix the leads to the electronic components;
moving the fixed leads and electronic components into the heating chambers of the second heating block following alignment of the heating chambers of the heating blocks; and
heating the second block with the fixed leads and electronic components therein to fix the jackets about the fixed leads and electronic components.

4,074,421

METHOD AND APPARATUS FOR CONNECTING CONDUCTORS TO TERMINALS OF AN APPARATUS

Rolf Torgny Reutling, Stockholm, and Nils Anders Rune Thysk, Skarholmen, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Sept. 15, 1976, Ser. No. 723,446
Claims priority, application Sweden, Oct. 17, 1975, 7511665
Int. Cl.[2] H01R 43/00
U.S. Cl. 29—628 7 Claims



1. A method of connecting an isolated electrical conductor to terminal tags of an apparatus in which a fixture having a series of holes formed therethrough is provided which series of holes is patterned in correspondence with the tags of the apparatus, comprising: advancing the electrical conductor to a first one of said series of holes of said fixture; repeatedly advancing said electrical conductor to the other of said series of holes, one after another; forming a loop through at least some of said series of holes after said electrical conductor has been advanced to the respective hole in which the loop is to be formed; thereafter inserting the tags of the apparatus through said series of holes which correspond therewith until the ends of said tags bear against the inner portions of said loops; and then joining said tag ends to the inner portions of said loops for permanent fastening.

4. An apparatus for connecting an isolated electrical conductor to terminal tags of a device, comprising: a fixture having a series of holes formed therein, said series of holes being patterned after said terminal tags of the device; storage means for storing said electrical conductor situated above said fixture; a cutter mounted for reciprocal movement toward and away from said fixture so that when said electrical conductor is advanced to said series of holes said cutter in its downward position will form loops in at least some of said holes, said cutter having an end nearest said fixture which is of narrower width than the rest of said cutter; carriage means mounting said storage means and said cutter for movement along said fixture to lay said electrical conductor above said holes; and fork means positioned below said fixture also mounted on said carriage means mounting said storage means and said cutter, said fork means having a first leg and a second leg which define

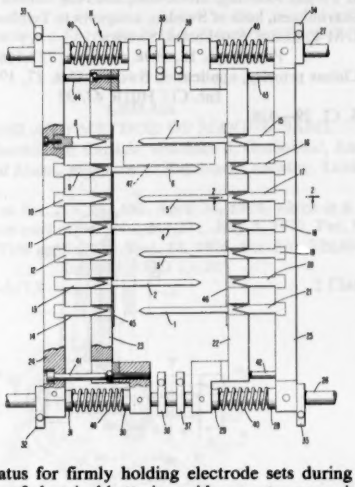
therebetween a space of greater dimension than the width of said end of said cutter, said fork means expanding the bottom of each loop formed in a hole in a direction transverse to the lengthwise direction of the hole so that the bottom portion of the loop is of greater dimension than the diameter of the hole whereby the loop is held in the hole.

4,074,422

APPARATUS FOR HOLDING ELECTRODE SETS

Anders Börjesson, Alvangen, and Tore Rehnberg, Nol, both of Sweden, assignors to Aktiebolaget Tudor, Sundbyberg, Sweden

Filed Jan. 26, 1977, Ser. No. 762,562
Claims priority, application Sweden, Sept. 12, 1975, 7513827
Int. Cl.² H01M *2/14*
U.S. Cl. 29—730 **12 Claims**



1. Apparatus for firmly holding electrode sets during the manufacture of electrical batteries, said apparatus comprising:
a plurality of laterally spaced partitions for separating sets of electrodes;
spaced partition holders each carrying some of said partitions;
said partition holders being movable toward one another to close around electrode sets disposed therebetween;
a plurality of wedges disposed substantially coplanar with said partitions;
said wedges being wider than said partitions;
spaced wedge holders each carrying some of said wedges;
said wedge holders being movable toward one another to move said wedges into overlying relation with said partitions to hold said electrode sets tightly.

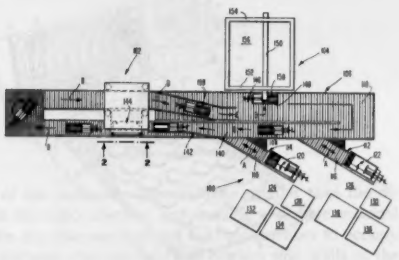
4,074,423

SYSTEM AND APPARATUS FOR ASSEMBLING INDUSTRIAL LEAD-ACID STORAGE BATTERIES

Hector L. DiGiacomo, Lafayette Hill, and John A. Secco, Wernersville, both of Pa., assignors to General Battery Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 652,715, Jan. 27, 1976. This application June 14, 1976, Ser. No. 695,858
Int. Cl.² H01H *69/02*
U.S. Cl. 29—730 **14 Claims**

1. A system for assembly industrial batteries, comprising:
a. conveying surface, comprising: a main surface; and at least one spur surface contiguous to said main surface;
b. a plurality of stacking box means freely movable across said conveying surface for selectively receiving, aligning and retaining the plates and separators of any of a plurality of sizes of battery plates so that the terminal edge of a battery stack formed from said separators and plates is locates in a reference plane substantially parallel to and spaced apart from said conveying surface at a preselected distance;
c. tilt table means for moving between a normal and a stacking position, said tilt table means comprising a tiltable portion of said spur surface, said tiltable portion in the normal position communicating with the remaining portion of said spur surface for transfer of one or more of said



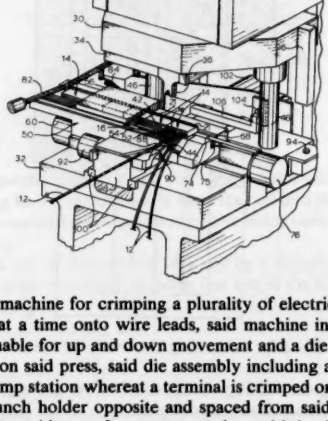
stacking box means therebetween, and in said stacking position for engaging and tilting said stacking box means through an acute angle with respect to said conveying surface to thereby allow the stacking of plates and separators therein; and
d. a burning station in communication with said main surface for receiving at least one stacking box means having disposed therein at least one battery stack with a terminal edge disposed within said reference plane, said burning station operating to form battery straps.

4,074,424

CRIMPING AND WIRE LEAD INSERTION MACHINE

Dushan C. Deshich, Elmhurst; Frank P. Chmela, Downers Grove, and Kenneth L. Kufner, Hickory Hills, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Mar. 1, 1977, Ser. No. 773,186
Int. Cl.² H01R *5/10*
U.S. Cl. 29—753 **7 Claims**



1. In a machine for crimping a plurality of electrical terminals one at a time onto wire leads, said machine including a press actuable for up and down movement and a die assembly mounted on said press, said die assembly including a die shoe with a crimp station whereat a terminal is crimped onto a wire lead, a punch holder opposite and spaced from said die shoe mounted on said press for movement therewith having punch means mounted over the crimp station to engage a terminal thereat, and a terminal feed assembly for supporting and feed-

ing a strip of terminals one at a time to the crimp station in response to the movement of the press, the improvement comprising:

an insertion station on the die shoe adjacent and aligned with the crimp station;

a housing feed assembly on the die shoe for supporting at least one connector housing, said housing having a plurality of terminal receiving recesses formed therein, and indexing one of said recesses at the insertion station; and

an insertion assembly, including means for gripping a terminated wire lead at the crimp station, for inserting said terminated wire lead into a terminal receiving recess at the insertion station.

4,074,425

APPARATUS FOR AUTOMATICALLY FEEDING AND SETTING STUD BOLTS

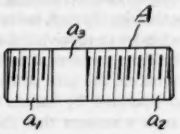
Hiroshi Hashimoto; Tetsuo Abe, and Akira Kato, all of Aichi, Japan, assignors to Sanyo Machine Works, Ltd., Japan

Filed Mar. 21, 1977, Ser. No. 779,836

Claims priority, application Japan, Mar. 19, 1976, 51-30282; Oct. 23, 1976, 51-142849[U]

Int. Cl.[2] B23P *19/06;* **B25B** *23/04*

U.S. Cl. 29—813 **2 Claims**



1. An apparatus for automatically feeding and setting stud bolts comprising a parts feeder unit including a parts feeder whereby a number of randomly charged stud bolts are arranged in a row and delivered; a bolt orienting unit including a reversing plate placed in the vicinity of the passageway of stud bolts and adapted to be projected and retracted in response to a detection signal from a direction detector for detecting the direction of stud bolts, whereby when a stud bolt is detected by said direction detector, if the stud bolt is found to have a forward direction it is allowed to pass with its direction maintained but if it is found to have a backward direction the reversing plate is projected in response to a detection signal from said direction detector to reverse the direction of the stud bolt and allow the latter to pass with its direction thus reversed, thereby assuring that when stud bolts are to be delivered their direction is always oriented; an escapement unit including a block which has a through-hole adapted to receive an axially directed stud bolt and which is slidably disposed in the guide hole of a housing so as to be reciprocated by the extension and retraction of the piston rod of an air cylinder, and a mechanical valve disposed at an end of the housing and having its operating portion projecting into the guige hole so that when the block is advanced its leading end actuates the mechanical valve to feed compressed air into the through-hole so as to forcibly deliver the stud bolt received in the through-hole; an impact wrench unit including a socket having an internally threaded portion engageable with the threaded portions of stud bolts, said socket being threadedly fitted in the front end of a piston which is inserted in the square hole of a block fixed to a cylinder barrel integrally joined to a pneumatically operable driving device so that said piston is slidable relative to the cylinder barrel and the rotation of the cylinder barrel can be transmitted thereto, and a self-holding valve adapted to be manually reset to stop the driving of said driving device and cut off the air being fed into the piston chamber for said piston and simultaneously feed air to the air cylinder of said escapement unit, so that said impact wrench unit is reliably fed with stud bolts one by one from said escapement unit and upon feeding of a stud bolt the driving device is driven while air is fed into the piston chamber so that the socket is rotated while being advanced to screw the stud bolt into intended work; a pneumatic pressure control unit for feeding compressed air produced by a compressor to said escapement unit and said impact wrench unit; and an electric control unit for driving and controlling said parts feeder of said parts feeder unit, said direction detector of said bolt orienting unit and said compressor of said pneumatic pressure control unit.

4,074,426

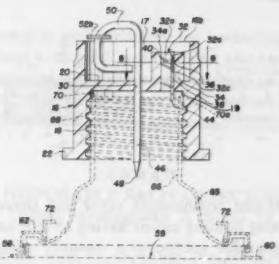
THREADED BLADE HOLDER

Michael W. Brandt, 1111 W. Mockingbird, Dallas, Tex. 75247

Filed Aug. 24, 1976, Ser. No. 717,092

Int. Cl.[2] B67B *7/00, 7/44*

U.S. Cl. 30—1.5 **11 Claims**



1. A blade holder comprising: a body, said body having an internally threaded hollow bore formed therein; a top on the body extending across one end of the bore, said top having a T-shaped blade receiving opening extending therethrough; a flat pointed cutting blade having a single cutting edge; and means in said T-shaped opening detachably securing said cutting blade to the top of the body such that the cutting blade extends downwardly into the bore in the body.

4,074,427

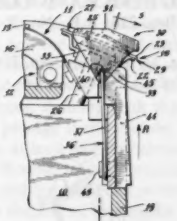
AUXILIARY TRIMMER ASSEMBLY

Michael John Marchetti, Bridgeport, and Edward Szymansky, Jr., Fairfield, both of Conn., assignors to Sperry Rand Corporation, Bridgeport, Conn.

Filed Jan. 12, 1976, Ser. No. 648,056

Int. Cl.[2] B26B *19/10*

U.S. Cl. 30—34.1 **13 Claims**



1. In an electric dry shaver,

a. a casing having a main cutter head mounted thereon,

b. a trimmer unit mounted on said casing adjacent said main cutter head and having a cutting surface formed by a stationary cutter and movable cutter mounted for movement relative thereto,

c. a protective guard assembly for said trimmer unit including a member for covering the cutting surface thereof,

d. said movable cutter of said trimmer unit provided with a pair of spaced and parallel rows of cutting surfaces, the first surface arranged in a plane above the main cutter

head and the second surface projecting outwardly of said casing, and

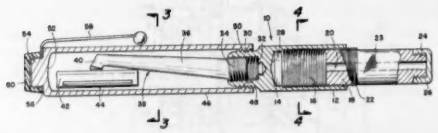
e. means mounting said guard member for controlled movement between positions alternately covering or exposing said second cutting surface and including spring means attached to said casing and having portions connected to said guard member.

4,074,428

POCKET RAZOR AND SHAVE CREAM DISPENSER

Raymond P. Roberts, Box 1117, Tulsa, Okla. 74101

Filed Feb. 4, 1977, Ser. No. 765,611
Int. Cl.[2] B26B *19/38*
U.S. Cl. 30—41 **4 Claims**



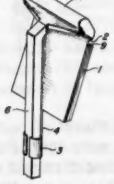
1. A pocket-size combination razor and shave cream dispense comprising housing means having an internally threaded chamber therein for receiving a quantity of shave cream therein, an externally threaded plug-type plunger member threadedly secured directly to the inner periphery of the chamber at one end thereof and extending into the chamber, said plug-type plunger member having a central bore extending longitudinally therethrough providing communication between the chamber and the atmosphere whereby movement of the plug-type plunger member in one direction with respect to the chamber forces the shave cream through the bore for discharge into the atmosphere, end cap means removably secured to the outer end of the plunger member for selectively closing the outer end of the bore, razor means removably secured to the housing means and extending longitudinally outwardly therefrom in a direction away from said plunger member whereby said plunger member is operable without removal of the razor from the housing means, and cover means removably secured to said housing in the proximity of said razor means for selectively encasing said razor during periods of non-use.

4,074,429

NOVEL LATHERING DEVICE AND RAZOR ASSEMBLY

Thomas G. Roberts, Box 223, R.D. No. 3, Stroudsburg, Pa. 18360

Filed Aug. 23, 1976, Ser. No. 716,547
Int. Cl.[2] B26B *21/44*
U.S. Cl. 30—41 **16 Claims**



1. A lathering device for attachment to a razor to provide a lathering composition in advance of the razor blade, which comprises:

a. a soap cake;

b. a container means for holding said soap cake; and

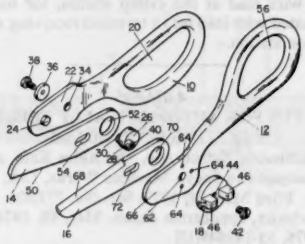
c. a means for securing the combination of soap cake and container means to said razor.

4,074,430

SHEARS

Tsuneyoshi Sugiyama, Seki, Japan, assignor to Feather Kogyo Kabushiki Kaisha, Japan

Filed Nov. 2, 1976, Ser. No. 737,984
Claims priority, application Japan, Jan. 20, 1976, 51-515213
Int. Cl.[2] B26B *13/04*
U.S. Cl. 30—260 **3 Claims**



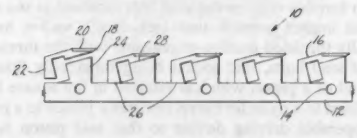
1. A shears comprising a pair of handles, a pair of blades and a circular and rotatable cam containing projections eccentrically located on both sides thereof, holes located on the upper part of each of the blades to receive the cam, holes located on each of the blade-holding portions of the handles to receive the cam projections, wherein the pair of handles and blades are held together and operated by means of said circular and rotatable cam in such a manner that the cam is sandwiched between the blades and fits into said receiving holes of the upper portions of the blades and wherein the handles are then fitted onto the projections located on both sides of the cam, and a knob lined up with the cam-projection receiving hole of one of the handles such that the angle between the handles and the blades may be changed by rotation of the cam.

4,074,431

SURGICAL KNIFE ASSEMBLY, SURGICAL BLADE, AND METHOD OF MANUFACTURE THEREOF

John R. Beaver, Lexington, and George J. Kozlowski, Bedford, both of Mass., assignors to Rudolph Beaver, Inc., Belmont, Mass.

Filed Apr. 21, 1976, Ser. No. 678,866
Int. Cl.[2] B26B *3/00*
U.S. Cl. 30—353 **5 Claims**



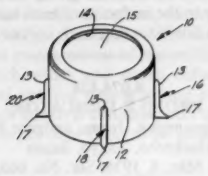
1. An elongated strip of metal formed into a guide portion and a series of blades extending from an edge of the guide portion at spaced intervals, said blades each having an outer edge extending parallel to the axis of the guide portion and being connected to the guide portion by a weakened portion, said strip being formed of a metal suitably heat treated to provide sufficient brittleness to permit separation of the blade from the strip by bending the blade out of the plane of the strip to cause fracture at the weakened portion.

4,074,432

INDEX COVER FOR KNOCK-OUT PUNCH

Romeo Alfieri, 336 W. 15th St., Holland, Mich. 49423

Filed May 24, 1976, Ser. No. 689,517
Int. Cl.[2] B26F *1/00*
U.S. Cl. 30—360 9 Claims



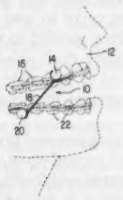
1. A removable indexing cover for use on a knock-out punch comprising a relatively thin-walled resilient, open ended body having a first end and a second end and shaped to fit snugly over the outer periphery of a cutting die associated with the knock-out punch, said body integrally including at least a pair of outwardly and longitudinally extending indexing projections having a first end spaced downwardly from said first end of said body and a second end flush with said second end of the body and extending outwardly a greater distance than said first end, said second end of said projections defining a pointed tip, and wherein said projections are spaced at a predetermined angular relationship from each other to provide means for aligning the knock-out punch on an object.

4,074,433

INTERMAXILLARY TOOTH MOVING DEVICE

John E. Nelson, Holtwood, Pa., assignor to Hamilton Technology, Inc., Lancaster, Pa.

Filed Sept. 7, 1976, Ser. No. 720,837
Int. Cl.[2] A61C *7/00*
U.S. Cl. 32—14 E 18 Claims



1. An orthodontic appliance for intermaxillary tooth correction comprising a pair of housings, a pulley rotatable inside each said housing, means for coupling said pulleys together including a cable end wrapped around each pulley and extending outwardly from each housing, and a spring in each housing coupled to said pulley for applying a bias force to said pulley tending to draw said cable ends into said respective housings, said cable ends having enlargements for preventing them from being wholly drawn into said housings.

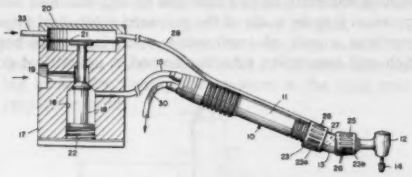
4,074,434

PRESSURE-RESPONSIVE SPEED CONTROL FOR DENTAL HANDPIECES

Milton R. Nielsen, Melrose Park, and Robert A. Olsen, Palatine, both of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Continuation-in-part of Ser. No. 262,095, June 12, 1972, abandoned. This application Feb. 12, 1976, Ser. No. 657,358
Int. Cl.[2] A61C *1/10*
U.S. Cl. 32—27 16 Claims

1. A pressure-responsive speed control system for dental handpieces comprising a dental handpiece having a workhead, an elongated pliant chamber having an exposed wall portion capable of being squeezed by an operator to reduce the internal cross section of said chamber, said chamber having an inlet communicating with a gas supply line and with pressure-responsive means, said pressure-responsive means being operatively connected to said handpiece for controlling the operating speed of said workhead, said chamber also having an outlet spaced a substantial distance along the length of said chamber from said inlet for bleeding gas from said chamber during operation of said speed control system.

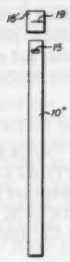


4,074,435

DISPOSABLE SALIVA EJECTOR

John Harry Orsing, Avangsgatan 2, S-253 71 Helsingborg, Sweden

Filed May 17, 1976, Ser. No. 687,134
Claims priority, application Sweden, May 20, 1975, 7505700; Mar. 10, 1976, 7603150
Int. Cl.[2] A61C *17/04*
U.S. Cl. 32—33 5 Claims



1. A disposable saliva ejector comprising a tubular stem open at both ends thereof, one open end of which being adapted to form a suction inlet opening through which saliva can be drawn by suction, and the other end thereof being adapted to be connected to a suction tube; and an external sleeve circumferentially disposed about said one end of the tubular stem and covering part thereof, defining with the exterior wall of the stem at least one passage therebetween; said sleeve having a cut extending over at least half the circumference thereof, and being formed of flexible material allowing the sleeve to be opened at the cut and the outer end portion of the sleeve to be turned away from the end of the tubular stem.

4,074,436

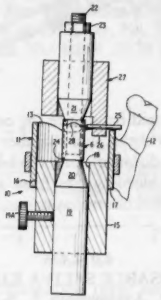
APPARATUS FOR USE IN SHAPING A TUBULAR DENTAL IMPRESSION ACCESSORY

Kenneth Henry Marshall, Castlecrag, Australia, assignor to Premach Pty. Limited, Sydney, Australia

Filed July 6, 1976, Ser. No. 702,962
Claims priority, application Australia, July 15, 1975, 2358/75
Int. Cl.[2] A61C *3/02*
U.S. Cl. 32—49 3 Claims

1. In a dental jig for the preparation of a patient's tooth for a jacket crown by which radial reduction and the provision of a contoured sub-gingival shoudler is effected on the tooth by a

cutting bur enclosed by a tubular sleeve having a contoured cam surface at a first end which functions to guide the axial extension of the cutting bur to determine the contour of the formed sub-gingival shoulder, apparatus for providing a contoured end on a dental impression tube to correspond said tube end to the contour of said sub-gingival shoulder to permit matching abutment of said tube end to said shoulder when an impression is to be made of the prepared tooth, said apparatus comprising a pair of confronting centering cones between which said impression tube is clamped, a cylindrical portion



supporting each said cone, a bored spigot about one of said cylindrical portions and securable in a second end of said tubular sleeve, means for anchoring said one cylindrical portion in said spigot in a position where a portion of said impression tube is located internally of and opposite said contoured cam surface, a collar slidable and rotatable upon the other said cylindrical portion, scribing means engageable with said portion of said impression tube to produce said contoured end and being carried by said collar, and means abutting said contoured cam surface to guide said scribing means during rotation of said collar.

4,074,437

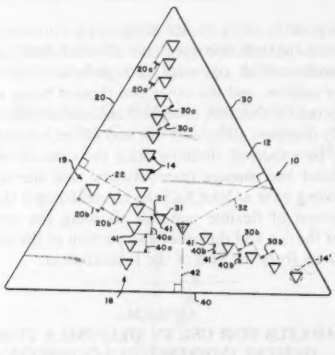
DRAFTING TEMPLATE

Peter G. Kindersley, 35 Wincrest Drive, Glens Falls, N.Y. 12801

Filed Nov. 18, 1976, Ser. No. 742,991

Int. Cl.[2] B43L *13/02*

U.S. Cl. 33—41 B **9 Claims**



1. A drafting instrument comprising an equilateral polygon-shaped sheet having x straight-edged sides wherein x is an integer larger than 2,

a plurality of equilateral polygon-shaped openings formed in said sheet, each opening having yx straight-edged sides wherein y is a positive integer,

said openings being disposed with respect to said sheet straight-edged sides so that for each opening there is a line perpendicular to each straight-edge side of said sheet that bisects an apex of said opening, and

said plurality of openings disposed in at least one series, in each series the distance from the apex of each opening to a corresponding apex in an adjacent opening being a constant throughout the series, relative to a given straight edge of said sheet, and a line connecting the corresponding apeces in a series intersecting each line extending perpendicular to the midpoint of each said sheet sides, and intersecting a line bisecting each corner of said sheet.

4,074,438

PROFILE INDICATOR

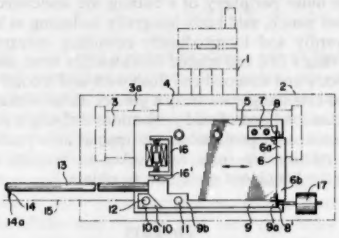
Yasuo Takeda, Utsunomiya, Japan, assignor to Kabushiki Kaisha Mitutoyo Seisakusho, Tokyo, Japan

Filed Mar. 3, 1976, Ser. No. 663,518

Claims priority, application Japan, Mar. 19, 1975, 50-036878[U]

Int. Cl.[2] G01B *5/20, 7/28*

U.S. Cl. 33—174 P **2 Claims**



1. In a profile indicator for measuring the contour of a surface, said indicator comprising a slide plate, an arm carried by the slide plate, and a stylus attached to one end of the arm, the improvement which comprises

a first link bar having a first pivot and a second pivot spaced from the first pivot, said first link being pivotally connected at said first pivot to said slide plate for swinging movement in a plane parallel to said slide plate,

a third link bar having a third pivot and a fourth pivot and pivotally connected to said slide plate at said third pivot for swinging movement in a plane parallel to said slide plate,

a second link bar having one end pivotally connected to said first link bar at said second pivot, and pivotally connected to said third link bar at said fourth pivot at the point on the second link bar which is spaced from said second pivot, said arm with the stylus being fixed to said second link bar, said first, second, third and fourth pivots, said first, second and third members, and said arm being positioned and configured such that swinging movement of said second link bar results in a compensating swinging movement of said first link bar to cause the tip of the stylus to move in a straight line.

4,074,439

MOLD DISCHARGE RACK GAPPING APPARATUS

Alfred J. Capriotti, Falls Township, Bucks County; Louis G. Lazzaretti, Economy Borough, and Brian O'Donnell, Bristol Township, Bucks County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 31, 1975, Ser. No. 645,597

Int. Cl.[2] G01C *15/00*

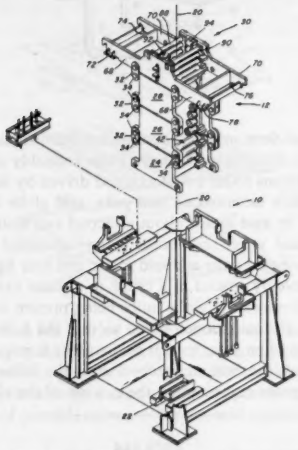
U.S. Cl. 33—286 **10 Claims**

1. Apparatus for accurately gapping and spacing a continuous casting discharge rack used in casting a steel product which is passed therethrough, such steel product having a given width dimension, a given depth dimension, a length dimension which is dependent upon the amount of material

being cast and a centerline, such discharge rack including width and depth defining elements for defining a given width and a given depth dimension for such product, said gapping and spacing apparatus comprising:

a support base;

means for establishing a gapping and spacing standard for such width and depth defining elements, said gapping and spacing means being secured to said support base and extending outwardly therefrom, said spacing and gapping means providing a standard, at least along part of its extension, for the measurement of the width and depth dimensions of such width and depth defining elements, said gapping and spacing means having a centerline passing therethrough which is collinear with the centerline of the width and depth dimension to be measured therefrom;



means, connected to said support base, adapted to receive such discharge rack and establish a plane of support for such discharge rack upon said apparatus normal to the centerline of said gapping and spacing means; and

means, formed as a portion of said means adapted to receive and establish a plane of support for the discharge rack, for precisely positioning a given benchmark point on successive discharge racks on said support base in a given spacial relationship to the centerline of said spacing and gapping means for establishing a common centerline through such successive discharge racks collinear with said centerline of said spacing and gapping standard establishing means, such that when a plurality of discharge racks are aligned in operational association with one another in a continuous casting machine, relative to the same given benchmark point on each, the centerlines through each discharge rack are aligned collinearly.

4,074,440

AUTOMATIC VACUUM DEHYDRATING APPARATUS IN A SLURRY CARRYING VESSEL

Tomiyasu Nohara, Takaki; Yoshiyuki Matsuno, Nagasaki; Hisamitsu Harada, and Akinori Yamada, both of Kobe, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Kabushiki Kaisha Kobe Seikosho, Kobe, both of Japan

Continuation-in-part of Ser. No. 568,681, April 16, 1975, abandoned. This application May 24, 1976, Ser. No. 689,514
Claims priority, application Japan, Apr. 24, 1974, 49-46810
Int. Cl.[2] F26B *13/30*
U.S. Cl. 34—92 **2 Claims**

1. In combination with a slurry carrying vessel having a hold for slurry, the hold having a bottom, an automatic dehydrating system, comprising:

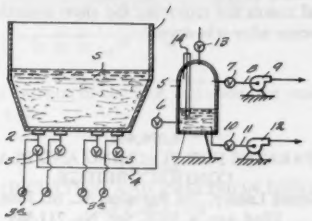
means defining a plurality of ports in the hold bottom;

a vacuum tank and means for drawing a vacuum in the tank;

dehydrating pipe means connected between the tank and each port and including a branch line for each port;

an automatically openable automatically closable valve interposed in each branch line so that each port is communicated through the respective branch line to the vacuum tank only when the respective valve is open;

a pressure sensing valve controller interposed in each branch line upstream of said valve therein, each controller including means for sensing the pressure in the hold near the respective port;



each controller being operatively connected to the respective valve for opening and closing that valve;

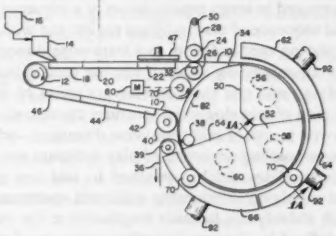
each controller sensing means including means for sensing whether the pressure in the hold near the respective port is close to atmospheric pressure, within a selected range having one limit below atmospheric pressure and another limit above atmospheric pressure, for closing the respective valve only if the sensed pressure lies within this range and for opening the respective valve if the sensed pressure is not within said range.

4,074,441

ROTARY THROUGH DRYER HAVING MULTIPLE VACUUM CHAMBERS AND ASSOCIATED HEATERS

Frederick D. Helversen, 1290 SW. Sixth Ave., Portland, Oreg. 97204, and Morris R. Rivers, Vancouver, Wash., assignors to Frederick D. Helversen, Portland, Oreg.

Filed Mar. 8, 1976, Ser. No. 664,992
Int. Cl.[2] D21F *5/18*
U.S. Cl. 34—122 **13 Claims**



1. A sheet drying apparatus comprising:

a movable endless foraminous conveyor for carrying fibrous sheet material to be dried;

forming means for forming said sheet material on said conveyor from liquid stodz deposited on said conveyor;

a rotary dryer drum having foraminous side wall about which said conveyor extends for drying the sheet material on the same conveyor on which it is formed;

support means including bearings for supporting the dryer drum for rotation;

a plurality of separate vacuum chambers fixedly mounted within the dryer drum for drawing moisture from the

sheet material into said chambers through said side wall of said drum, each chamber having a separate fixed exhaust conduit which extends out through an end of the dryer drum at a position radially spaced from the support means;

vacuum means connected to the exhaust conduits of said vacuum chambers for independently controlling the vacuum pressures in said chambers;

heating means outside of the dryer drum for causing heated gas to flow through the sheet material and said conveyor into said vacuum chambers for heating the sheet material in a plurality of heating zones of different temperatures positioned over and in registration with the vacuum chambers; and

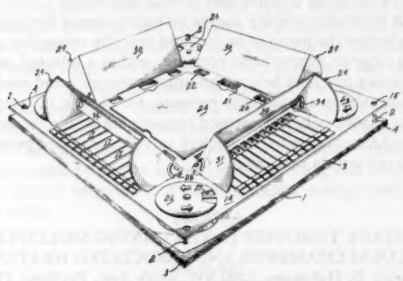
removal means for removing the sheet material from said conveyor after it is dryed.

4,074,442

APPARATUS FOR TEACHING AND PLAYING CONTRACT BRIDGE

Joseph Gérard Landry, 754 Raymond St., St. John, Canada

Filed Aug. 4, 1976, Ser. No. 711,549
Int. Cl.[2] G09B *19/22*
U.S. Cl. 35—8 B **4 Claims**



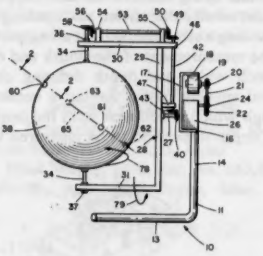
1. An apparatus for teaching and playing a card game comprising a baseplate, at least one sheet operatively resting on the baseplate, having playing cards indicia marked on one face thereof and arranged in series each representative of a player's hand, and having sequence of play indicia marked on said one face and arranged in series repesentative of a sequence of play, each of said sequence of play indicium registering with a corresponding playing card indicium in a transverse direction relative to the corresponding series of playing card indicia, a top plate overlying said one sheet and having series of elongated apertures, each of said elongated apertures operatively extending lengthwise in one of said transverse directions and overlying the corresponding sequence of play indicium and playing card indicium, slides slidably attached to said top plate and retained in overlying relationship with said apertures respectively, each slidably displaceable lengthwise in the transverse direction defined by the corresponding sequence of play indicium and playing card indicium, and each settable in anyone of three distinct positions including a position overlying both corresponding indicia, a position uncovering only the corresponding sequence of play indicium, and a position uncovering only the corresponding playing card indicium, and shields operatively fixed on said top plate and concealing said series of indicia from other players' views, as compared to the player having the corresponding hand, and wherein each of said shields operatively overlies both corresponding series of sequence of play indicia and playing card indicia and a flap is adjustably carried in each shield and selectively conceals the corresponding series of sequence of play indicia.

4,074,443

ATOM DEMONSTRATOR

Edward D. Wilkerson, P.O. Box 755, South Court, Normandy Beach, N.J. 08739

Filed Nov. 16, 1976, Ser. No. 742,193
Int. Cl.[2] G09B *23/26*
U.S. Cl. 35—18 A **1 Claim**



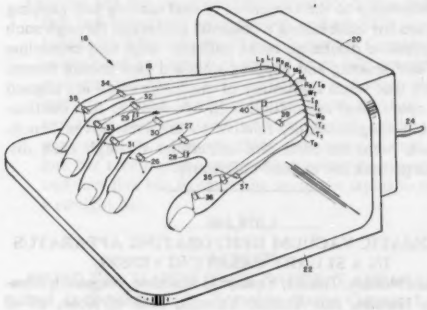
1. An atom demonstrator, comprising; frame means, a motor mounted on said frame means, a yoke rotatably mounted on said frame means about a first axis and driven by said motor, a globe rotatably mounted on said yoke, said globe being rotatably driven by said motor about a second axis stationary with respect to said yoke, said motor being connected to simultaneously rotate said yoke and said globe, and four light bulbs on said globe evenly spaced in a circle in a plane extending diametrically through the globe bulbs being present on the globe only in the aforementioned plane so that the bulbs represent the electrons of an atom so that as the globe is rotated simultaneously about the first and second axes, the bulbs will scribe curvilinear paths representing the motion of the electrons.

4,074,444

METHOD AND APPARATUS FOR COMMUNICATING WITH PEOPLE

Charles J. Laenger, Sr.; Sam R. McFarland, and Harry H. Peel, all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Sept. 30, 1976, Ser. No. 728,404
Int. Cl.[2] G09B *21/04*
U.S. Cl. 35—35 A **12 Claims**



1. A method for communicating with persons who understand the one-hand manual alphabet, consisting of the following steps:

generating a coded signal for a preselected alphanumeric character, said preselected alphanumeric character being one of a plurality of alphanumeric characters;

converting said coded signal to generate a single output for said preselected alphanumeric character;

moving a mechanical hand in response to said single output

to form said preselected alphanumeric character in said one-hand manual alphabet;

reading said preselected alphanumeric character by feeling said mechanical hand.

4,074,445

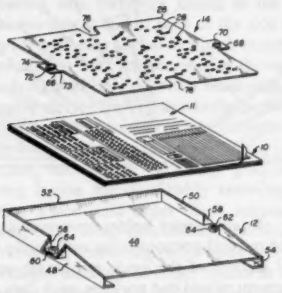
METHOD AND APPARATUS FOR CONSTRUCTING AND GRADING OBJECTIVE EXAMINATIONS

Ben Joseph Friedman, 315 E. Ninth St., New York, N.Y. 10003

Filed Mar. 24, 1975, Ser. No. 561,593

Int. Cl.[2] G09B 3/08

U.S. Cl. 35—48 A **5 Claims**



1. Apparatus for scoring an examination answer sheet of the type having question indicia for designating a plurality of questions and a plurality of separately positioned answer spaces associated with each question indicia corresponding to a plurality of possible answers thereto, said apparatus comprising:

a grading tray including a base support for said answer sheet;

a template having a plurality of holes therein corresponding to predetermined answer spaces on said answer sheet representing the correct answers for said plurality of questions;

means on said base support for registering said template holes with said spaces on said answer sheet disposed on said base support, said template being variably orientable relative to said answer sheet on said base support, whereby to change the answer spaces on said answer sheet in register with said template holes;

means for indicating the orientation of said template relative to said answer sheet;

said template relative to said answer sheet and said answer sheet being rectangular and said registering means comprising an upstanding wall for engaging no more than three sides of the rectangular peripheries of said template and answer sheet;

said registering means further comprising a discontinuity in the periphery of said template and a plurality of complementary interfitting surface discontinuities in said upstanding wall.

4,074,446

SKI BOOT

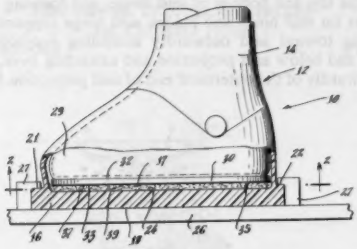
Joel Howard Eisenberg, 53A Blackhawk Lane, Stratford, Conn. 06497

Filed June 18, 1976, Ser. No. 697,437

Int. Cl.[2] A43B 5/04, 13/18; A63G 9/16

U.S. Cl. 36—120 **17 Claims**

1. A ski boot for holding a foot of a skier, said ski boot comprising an outer boot having a substantially inflexible upper shell, and support means disposed inside said outer boot near said ski in such a manner that said support means is laterally tiltable with respect to said ski and said outer boot upon



inversion or eversion of said foot, and means for attaching said ski boot to a ski.

4,074,447

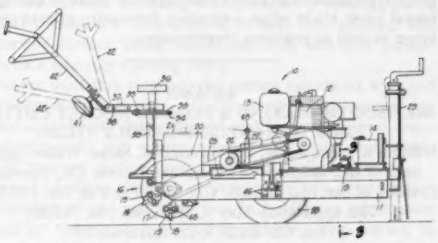
STUMP CUTTING AND PRECISION DIGGING APPARATUS

Norman E. Shivers, Jr.; David E. Shivers, both of 121 W. El Segundo, Los Angeles, Calif. 90061, and Paul N. Shivers, 424 E. Foothill Blvd., Apt. D, Monrovia, Calif. 91610

Filed Aug. 16, 1976, Ser. No. 714,568

Int. Cl.[2] A01G 23/06

U.S. Cl. 37—2 R **18 Claims**



1. A stump cutting and digging apparatus comprising in combination:

a main supporting frame of a vehicle member, the frame having an integral elongated channel which acts as a guide for controlling cut material;

a cutting wheel mounted on the frame and longitudinally aligned with the channel for rotation about a horizontal axis transverse to said channel, said cutting wheel having a plurality of radially extending cutting teeth circumferentially mounted on the cutting wheel; and

drive means for powering said cutting wheel to cut material and to convey a majority of the cut material through the channel of said frame of the vehicle member.

4,074,448

HINGED SNOWPLOW, CONVERSION KIT, AND METHOD THEREFOR

W. Wally Niemela, Box 165E, Chassell, Mich. 49916

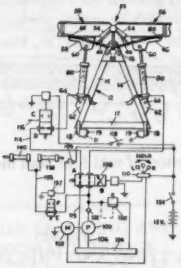
Filed June 17, 1976, Ser. No. 697,037

Int. Cl.[2] E01H 5/00

U.S. Cl. 37—41 **51 Claims**

1. A hinged snowplow for vehicles comprising a support frame having an outwardly extending projection; means for securing said support frame to a vehicle; a pair of generally elongated plow blades; a central hinge having a generally vertical axis; means for securing said plow blades to said hinge one on either lateral side thereof for pivotal movement about

said generally vertical axis independent of one another; said hinge including a single, generally vertical, hinge support member extending toward and secured to said outwardly extending projection of said support frame generally intermediate the top and bottom of said hinge, and forming a central support for said hinge and blades, said hinge support member tapering toward said outwardly extending projection from above and below said projection and extending over, beyond, and inwardly of the outermost end of said projection for stability and support strength; a pair of blade positioning arm means for positioning said blades and holding said blades as positioned, each of said arm means extending between said support frame and one of said plow blades; means for pivotally securing each of said arm means to both its respective plow blade and said support frame; said blades being movable between positions forming a forwardly extending V with said central hinge forwardmost to a forwardly open V position having the lateral plow blade edges extending forwardly of said central hinge as well as positions therebetween.

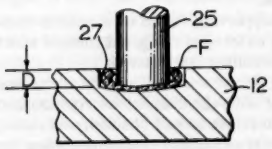


4,074,449

METHOD OF MAKING A LOADER BUCKET CUTTING EDGE WITH RECESSED BOLT STUDS

William E. Lanz, Joliet, and Visvaldis A. Stepe, Willow Springs, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 733,689, Oct. 18, 1976, Pat. No. 4,052,803.
This application May 9, 1977, Ser. No. 795,357
Int. Cl.[2] E02F *9/28;* A01B *35/26*
U.S. Cl. 37—141 R **5 Claims**



1. A method for forming a cutting edge for use on a loader bucket or the like comprising the steps of

forming at least one recess on said cutting edge,

positioning a lower end of a fastening stud in said recess, and

welding the lower end of said fastening stud to said cutting blade.

4,074,450

BINDER FOR DATA CARRIER HOLDERS

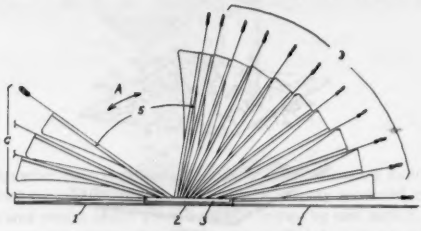
Dieter Klaus-Jürgen Schweinsberg, 8631 Lautertal-Unterlauter, Germany

Filed Oct. 13, 1976, Ser. No. 732,014
Claims priority, application Germany, Apr. 26, 1976, 2618261
Int. Cl.[2] G09F *13/00*
U.S. Cl. 40—403 **3 Claims**

1. A binder comprising a substantially rectangular flat front cover member, a substantially rectangular flat rear cover member, and a back member hingedly connecting said front cover member and said rear cover member along adjacent edges thereof, data carrier holders mounted at said back member by means of guide rails disposed at those back member edges

which are not hingedly connected to said front cover member or said rear cover member, said guide rails being provided with straight grooves facing each other,

rod means being provided at that data carrier holder edge which, when mounted at said back member, is adjacent thereto, said rod means extending beyond said holder edge and having end portions slidingly and pivotably received in said grooves,



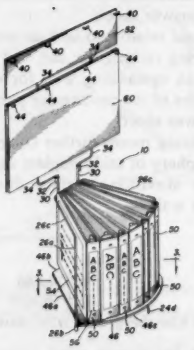
the number of data carrier holders mounted in said rails by means of said rod end portions being sufficiently small to leave a substantial amount of the guide rail length unoccupied for sliding movement of said end portions, each data carrier holder comprising a pocket member folded of resilient plastic film and having a substantially rectangular rear wall and two lateral front flaps whose opposing edges are spaced from each other, said front flaps being provided with score lines such that the flaps are biased away from said rear wall, said rod means axis being substantially perpendicular to said opposing flap edges, the bias of all flaps facilitating unfolding of said binder between two adjacent holders.

4,074,451

DISPLAY DEVICE

Sidney I. Jacobson, 4248 D'Este Court, Apt. 104, Lake Worth, Fla. 33463; Harold D. Jacobson, 2126 Valley Road, Northbrook, Ill. 60062, and Arthur F. Jacobson, 1281 Lynn Terrace, Highland Park, Ill. 60035

Filed Aug. 9, 1976, Ser. No. 712,858
Int. Cl.[2] G09F *1/00;* A47B *65/00*
U.S. Cl. 40—610 **5 Claims**



1. A point-of-purchase display device for supporting and displaying loose-leaf binders and for supporting order blanks for enabling a purchaser to selectively order the binders in accordance with specifications which best meet the purchaser's requirements, comprising a self-supporting loose-leaf

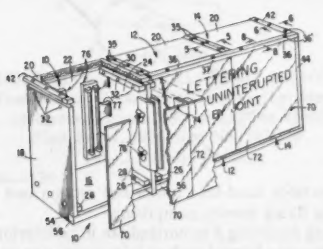
binder receiving portion, and an order blank supporting portion associated with the loose-leaf binder receiving portion, said binder receiving portion having a base frame which has a front facing member joined at its ends to rearwardly and inwardly extending side members, each of said side members being joined at its rearwardmost end to a back member which is substantially parallel to and shorter in length than the front facing member, said base frame further having a support member joined to the front member and the back member of the base frame between the side members and extending outwardly from the front member of the base frame, said binder receiving portion also having a side support frame provided with upwardly extending members joined to the base frame at the front facing member thereof, each of the upwardly extending members of the side support frame having rearwardly and inwardly extending side members joined to the upper end thereof, the rearwardmost end of each of the side members of the side support frame being joined to a back member which is substantially parallel to the back member of the base frame of the binder receiving portion, said order blank supporting portion of the display device having upwardly extending binder receiving portion engaging members joined to the back members of the base frame and the side support frame of the binder receiving portion, said binder receiving portion engaging members having means for detachably receiving an order blank supporting frame, said order blank supporting frame having upwardly extending substantially vertical members joined to a horizontally extending order blank receiving member for supporting a plurality of order blanks in an elevated position above the loose-leaf binder receiving portion of the display device, said order blanks having indicia thereon which enable a purchaser to self-initiate the ordering to his exact specifications of a binder, or binders, supported on the loose-leaf binder receiving portion of the display device.

4,074,452

KNOCKDOWN LIGHTING BOXES AND MEANS FOR CLAMPING THE FRONT PANELS THEREOF

Alex J. Bellinder, 221 Highland Drive, Mundelein, Ill. 60060

Filed Aug. 12, 1976, Ser. No. 713,695
Int. Cl.[2] G09F *13/00*
U.S. Cl. 40—571 **10 Claims**



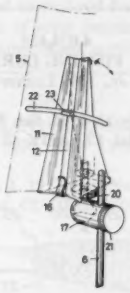
1. A plurality of light boxes adapted to be transported and/or stored in a knocked-down and disassembled condition to be assembled, set up, and connected together, comprising spaced end walls, a rear wall, top and bottom members and a divider between each pair of adjacent light boxes, a front panel for each light box, each front panel having a flange at right angles to the plane of the panel, clamping means including a pair of elongated strips connected by fastening means engaging the flanges of adjacent front panels for securing the adjacent flanges on adjacent panels together, said strips having beveled edges to eliminate shadows on the associated front panels so that the front panels are connected to each other free of exterior mullions therebetween to present a continuous front panel surface, and lighting means positioned inside each said light box for illuminating said front panels.

4,074,453

DEVICE FOR HOLDING FLEXIBLE, YIELDABLE INFORMATION CARRIERS

John E. Knox, Klosterhof 4, 7581 Eisental-Affental, Germany

Filed July 14, 1975, Ser. No. 595,815
Int. Cl.[2] B41J *11/64*
U.S. Cl. 40—352 **3 Claims**



1. A device for holding flexible, yieldable information carriers such as paper in a correct readable position, comprising:

securing means for clamping the flexible, yieldable information carrier to at least partially stiffen the same, so that it remains in a freely supported reading position, said securing means comprising a member including first and second connected surfaces,

said first surface including a longitudinally running curve and a magnetic strip built-in to said first surface, said second surface being connected with said first surface with a laterally running curve,

a runner including magnetizable means associated with and cooperating with said magnetic strip, a retaining clamp associated with the bottom of said first surface and cooperating with said runner whereby to retain an unstable information carrier pressed against said first surface,

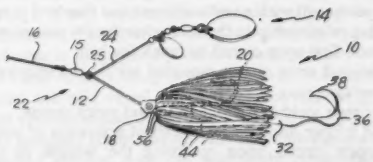
a groove holding element formed on one pair of two opposite sides of said second surface for holding an information carrier thereagainst, a flexible yieldable strip having its ends held by said groove holding element on each of said two opposite sides, said yieldable strip being wider than the distance between said two opposite sides and adjusted to press against said second surface and held thereto by said groove holding elements, and gripper means associated with said yieldable strip for separating said strip from said second surface whereby to permit insertion of an information carrier onto said second surface, said member being adapted to have an information carrier placed onto either said first or said second surfaces whereby to permit said member to be used in different positions thereof.

4,074,454

FISHING LURE

Carl R. Cordell, Jr., P.O. Box 2020, Hot Springs, Ark. 71901

Filed Nov. 22, 1976, Ser. No. 744,099
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.28 **23 Claims**



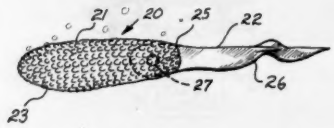
1. A lure for attachment to a fish hook, which comprises

skirt means having a plurality of skirt members, and curled tail means comprising a thin piece of flexible material having substantially planar parallel flat surfaces and including an elongated body portion and a curvilinear tail portion extending integrally from one end thereof, the other end of said elongated body portion of said piece of flexible material being connected to said skirt means.

4,074,455
FISHING LURE

William O. Williams, Jr., 1309 Lynhurst Drive, Gastonia, N.C. 28052

Filed July 12, 1976, Ser. No. 704,453
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.06 **12 Claims**

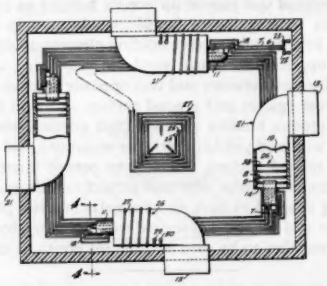


1. A fishing lure having a body of soft plastic material with a surface that is formed with a plurality of small closely spaced pockets of generally semispherical configuration having internal surface characteristics for releasable retention of air bubbles in said pockets when said lure is immersed in water to provide a glistening scaly appearance and a life-like breathing effect upon release of air bubbles.

4,074,456
PEST TRAP

Robert Wayne Tidwell, 15330 Harding Lane, Leisure City, Fla. 33030

Filed Oct. 18, 1976, Ser. No. 733,320
Int. Cl.[2] A01M *1/22, 23/38*
U.S. Cl. 43—98 **7 Claims**

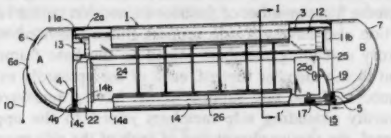


1. A trap apparatus containing a bait to attract rodents, insects, and like pests, comprising:
- an enclosure;
- means for entry into said enclosure;
- a source of electricity;
- a first open circuit powered by said source of electricity positioned within said enclosure and disposed in surrounding relationship to the bait, whereby the pest must engage said first open circuit to reach the bait;
- a second open circuit mounted within the interior of said entry means;
- a tripper yieldably attached to said entry means;
- said tripper disposed for electrical activation of said second open circuit upon receiving the weight of the pest, whereby the pest must engage said second open circuit to retreat up said entry means.

4,074,457
INSECTS CATCHER ASSEMBLY

Hitoshi Sato; Hazime Watanabe; Kazumasa Miura, all of Kawaguchiko, and Koji Kudo, Matsudo, all of Japan, assignors to Kawaguchiko Seimitsu Co., Ltd., Kawaguchiko, Japan

Filed May 12, 1976, Ser. No. 685,928
Claims priority, application Japan, May 12, 1975, 50-57126
Int. Cl.[2] A01M *1/04*
U.S. Cl. 43—113 **8 Claims**

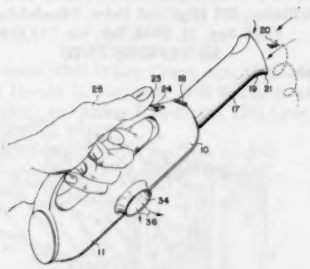


1. In an insects catcher assembly comprising a framework, fluorescent lamp means mounted within the framework for attracting flying insects theretowards and a sticky insects catcher band strip positioned in proximity to said fluorescent lamp means, the improvement comprising:
- a pan extending longitudinally with respect to said lamp for collecting insect bodies and being adapted to be detachably attached to the framework; and
- holding means extending upwardly from both ends of said pan for holding the sticky insects catcher band strip under tension in a working position substantially parallel to said longitudinal direction of said pan.

4,074,458
FLY GUN

Richard E. Catlett, Port Angeles, Wash., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 23, 1976, Ser. No. 660,711
Int. Cl.[2] A01M *1/06*
U.S. Cl. 43—139 **2 Claims**



1. A portable hand-held motorized suction unit for use in entrapping flying insects, comprising
- a housing enclosing a motorized fan in an interior chamber, said housing formed with an inlet opening to said chamber to which opening nozzle section having an internal opening is externally joined, with
- a mesh cage mounted in said chamber between the said fan and said nozzle opening, said cage open to the said chamber inlet opening,
- said nozzle section formed with a flared inlet opening, in which
- a handle is externally mounted to the housing, the axis of which handle is generally parallel to the axis of the nozzle section, amd perpendicular to the axis of
- an external exhaust opening formed in the housing, which is joined to said interior chamber, said exhaust opening extending to the atmosphere in a direction perpendicular both to the axis of the nozzle section and to the axis of the handle so that exhaust air expelled through said outlet opening to the atmosphere is directed away from both the

inlet opening of the nozzle section and away from the body of a user holding the handle when the nozzle section is pointed forward of the body of the user.

4,074,459
TOY BALLERINA DOLL
Ana Lopez, GPO Box 329, New York, N.Y. 10001
Filed Feb. 14, 1977, Ser. No. 768,088
Int. Cl.[2] A63H *13/02*
U.S. Cl. 46—47 **1 Claim**

1. A toy, comprising in combination, a doll mounted along a single line extending through said doll and protruding from upper and lower ends thereof, opposite ends of said line being free and each end being fitted with a ring for being held in hands of an operator, and said opposite ends of said line extending from said doll and being flexible so that they can be wound up; said doll being made in the appearance of a ballerina dancer, said line being comprised of a length of chain, a string and a rubber band, said chain being attached to and contained within said doll and extending from a top of a head thereof, to a crotch thereof, one said extending end of said line comprising said string, and the other said extending end of said line comprising said rubber band, and said doll having movable legs and arms.

4,074,460
DOLL SIMULATING SUCKING ACTION
Herbert Thorn, Great Neck, and Harvey Berkin, Merrick, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.
Filed July 1, 1976, Ser. No. 701,470
Int. Cl.[2] A63H *13/02*
U.S. Cl. 46—135 R **21 Claims**

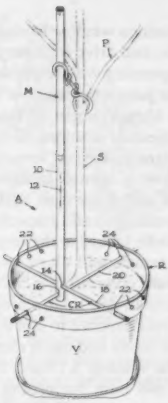
1. A doll assembly comprising,

a hollow head portion having a mouth aperture and a pair of flexible cheek portions,

an actuator member, said actuator member comprising an elongated rod slidably mounted in said head for longitudinal sliding movement towards and away from said mouth aperture, and

means for connecting said actuator member to said flexible cheek portions for flexing said cheek portions inwardly when said actuator member is moved away from said mouth aperture with said connecting means comprising a rigid frame with a central portion which surrounds said rod and is mounted on said rod for movement therewith and having a pair of arms respectively secured to the interior of said flexible cheek portions.

4,074,461
PLANT SUPPORT
Abraham Hirschman, 9039 Sligo Creek, Apt. 1003, Silver Spring, Md. 20901
Filed Apr. 1, 1977, Ser. No. 783,832
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—70 **31 Claims**



1. Upright plant-support means for use with peripheral rim portions of flower pots and other plant-growing vessels, comprising:

(a) a vessel for growing flowers and plants, said vessel having an upstanding peripheral rim;

(b) mast means including an elongated mast having a longitudinal axis and adaptable for disposition with said axis in a generally vertical manner in conjunction with the plant-growing vessel;

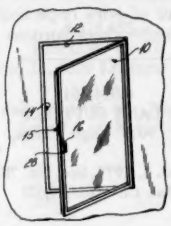
(c) said mast means including a lowermost free end portion provided closely adjacent thereto with a pair of cross-disposed apertures each formed to pass generally through the axis of said mast means generally transverse to its length and in relatively close but axially spaced relation at generally right angles to each other;

(d) a pair of elongated, mast-supported rods for respectively traversing said cross-disposed apertures at said lowermost end portion of said mast means and in close-fitting slidable relation, for stabilizing said mast in vertically supported relation to said rods;

(e) mounting means for respectively interconnecting predeterminable rim portions of said vessel with generally end portions of said cross-oriented rods, for affixing the mast and cross-rod assembly to said plant-growing vessel with said mast in the generally vertical position; and

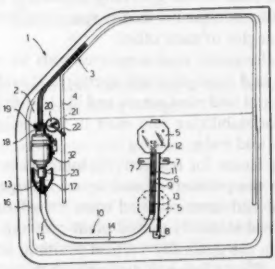
(f) said pair of rods being in assembly with both said mast means and said vessel rim, and respectively being of at least vessel-rim-chord-spanning length generally horizontally spanning across and operatively mounting in a cross-disposed manner with the selectively predeterminable circumferentially spaced rim portions of said vessel.

4,074,462
MULTI-POSITION WINDOW
Murray Parker McHeffey, Little Silver, N.J., assignor to Extrudart Metal Products, Inc., Clifton, N.J.
Filed Dec. 6, 1976, Ser. No. 747,491
Int. Cl.[2] E06B *11/00*
U.S. Cl. 49—192 7 Claims



1. In a multi-position window having a drive train coupled to a window handle, said drive train movable around the edge of the window cooperating with respective elements in the frame of the window to permit the window to be closed, tilted open, or swung open by movement of the handle and associated drive train to respective positions, an improvement comprising safety detent means connected to said window and actuated when said window is opened to either a tilt or swung open position to block said drive train against movement from the position corresponding to said respective open position of said window, said handle locked in the respective position enabling said window to assume said tilt or swung open positions, said safety detent means comprising a catch member spring biased to block movement of said train, a projecting end of said catch member and a strike attached to said frame bearing against said projecting end to move said catch member from said blocking position when the window is closed, further comprising a key operated latch, said train comprising a slot, said slot of said train and said latch cooperating to block movement of said handle to said swing open position and to permit movement of said handle for said window to assume said tilt position.

4,074,463
ELECTRICALLY CONTROLLED WINDOW REGULATOR
Franco Colanzi, Turin, Italy, assignor to RIV - SKF Officine di Villar Perosa S.p.A., Turin, Italy
Filed Sept. 15, 1976, Ser. No. 723,384
Claims priority, application Italy, July 27, 1976, 68871/76
Int. Cl.[2] E05F *11/48*
U.S. Cl. 49—352 5 Claims



1. An electrically controlled window regulator, particularly for raising and lowering a window mounted in a motor vehicle door, the regulator comprising:

slide means rigidly connectable to said window;

a guide for said slide means, said guide being rigidly connectable to a support for said window;

a flexible screw connected to said slide means and arranged to make outward and return translatory movements to move said slide means along said guide between a closed and an open position, said flexible screw consisting at least partly of a precompressed spring;

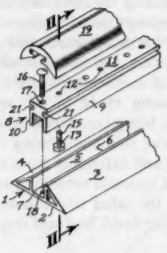
a flexible sheath in which said flexible screw extends in slidable manner, said flexible sheath having an end portion which extends along said guide and is formed with a slot-form opening extending therealong;

an appendix connecting said slide means to said flexible screw and extending through said slot-form opening in said flexible sheath;

a recirculating ball nut through which the precompressed spring extends and which is coupled drivingly to said precompressed spring, whereby rotation of the ball nut brings about translation of the flexible screw; and

a reversible electric motor connectable to said support and having a central hollow through shaft which is rotated upon operation of the motor, the flexible screw extending through said shaft and said shaft being connected to said recirculating ball nut so that the ball nut rotates with said shaft.

4,074,464
ADJUSTABLE THRESHOLD
Dariel McCay, P.O. Box 649, Lexington, Tenn. 38151
Filed Oct. 4, 1976, Ser. No. 729,859
Int. Cl.[2] E06B *1/70*
U.S. Cl. 49—468 5 Claims



1. An adjustable threshold including:

a. an elongated base having a bottom, holes in the bottom, sloping sides, and vertical walls, the vertical walls and bottom of the base forming a channel extending through the length of the base and the sloping sides connecting the upper surfaces of the vertical walls and the outer edges of the bottom;

b. an elongated bar positioned in the channel and having an inverted U-shaped cross-section formed by depending legs connected on their upper surface by an elongated step-plate, having a horizontal upper surface, the step-plate having elongated grooves along its length and holes having their axis perpendicular to the upper surface of the step-plate with at least two of said holes internally threaded;

c. bolts screwed into the threaded holes in the step-plate with the head of the bolts resting on the bottom of the base;

d. screws passing through holes in the step-plate and the holes in the bottom of the base, and

e. an elongated cover constructed of flexible rubber material and having a crescent-shaped cross-section with a convex outer surface and concave inner surface, depending legs having V-shaped outer ends biased toward each other and elongated protrusions along the length of the concave inner surface, with the cover fitted over the base and bar,

and its protrusions fitting within the grooves of the step-plate.

4,074,465

FLEXIBLE CHANNEL-SHAPED SEALING AND GUIDING STRIPS

Robert G. Bright, Viersen, Germany, assignor to Draftex Development AG, Switzerland

Filed Jan. 7, 1976, Ser. No. 647,183

Claims priority, application United Kingdom, Jan. 9, 1975, 888/75

Int. Cl.[2] E06B *7/16*

U.S. Cl. 49—491 1 Claim

1. A channel-shaped sealing strip, comprising a plurality of side-by-side strip-like metal elements each being of U-shape so as to define two legs and a base,

each element overlapping the adjacent elements on each side of it but so that each pair of alternate elements overlaps the same face of the intervening element,

flexible connecting links each connecting part only of the length of one leg of one of the elements to a corresponding part, only, of the adjacent leg of the next element and being integral with the connected elements,

the elements being otherwise not directly connected to each other,

the connecting links being attached to the elements along lines which are spaced inwardly of the elements from the side edges thereof, each connecting link extending between positions spaced from the distal ends of the two legs that it connects and extending between those positions in a direction inclined with respect to the major planes defined by the two legs the particular link connects, and

a covering of elastomeric material completely enclosing the elements and their connecting links.

4,074,466

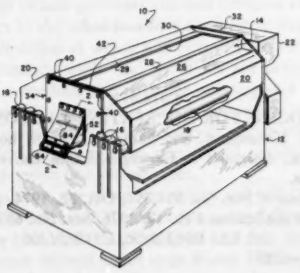
VIBRATORY FINISHING SYSTEM

John F. Rampe, Cleveland, Ohio, assignor to Rampe Research, Cleveland, Ohio

Filed Mar. 29, 1977, Ser. No. 782,519

Int. Cl.[2] B24B *31/00*

U.S. Cl. 51—163.1 18 Claims



1. A vibratory finishing machine comprising a frame, a tub adapted to receive workpieces and finishing media and having an outlet for workpieces and finishing media, mounting means mounting the tub on the frame for vibratory movement, vibratory drive means for vibrating the tub to impart a finishing action to its contents, and discharge means for discharging workpieces and media through the tub outlet including closure means responsive to pressure forces exerted by tub contents on the closure means for periodically opening and closing the tub outlet.

4,074,467

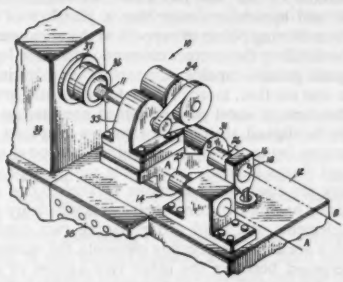
GRINDING MACHINE CONTROL

Edward George Robillard, Cherry Valley, Mass., assignor to Cincinnati Milacron-Heald Corporation, Worcester, Mass.

Filed Mar. 14, 1977, Ser. No. 777,024

Int. Cl.[2] B24B *49/00*

U.S. Cl. 51—165.92 24 Claims



1. A grinding machine of the type having a base, a wheelhead carrying an abrasive wheel, a wheel motor for rotating the abrasive wheel, a headstock supported on the base and means for effecting relative movement between the wheelhead and its stock, said effecting means being responsive to a control generating a number of signals to define a grinding cycle having a number of modes including:

(1) a rapid advance mode for positioning the wheelhead and headstock preparatory to grinding and during which no grinding is anticipated, said rapid mode being initiated by a first signal from the control,

(2) a gap eliminator mode for positioning the wheelhead and headstock to initiate the grinding process, said control generating a second signal to terminate the rapid advance mode and begin the gap eliminator mode, and

(3) a grinding mode for performing the grinding operation, wherein the improvement comprises:

(a) means responsive to the wheel motor for providing a grinding force signal representing the forces of the grinding process, said providing means operating with each grinding cycle to continuously compensate the grinding force signal as a function of the changes in the nongrinding forces on the wheel motor;

(b) means responsive to the first signal and the grinding force signal and connected to the effecting means for producing an interference signal to modify the grinding cycle in response to the grinding force signal exceeding a predetermined magnitude;

(c) means responsive to the second signal and the grinding force signal and connected to the effecting means for producing a gap elimination signal in response to the grinding force signal exceeding the predetermined magnitude, said gap elimination signal operating to terminate the gap eliminator mode and begin the grinding mode; and

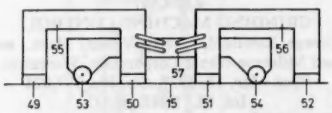
(d) means responsive to the grinding force signal for producing an output signal in response to the grinding force signal exceeding a second predetermined magnitude; and

(e) means responsive to the output signal for controlling the grinding cycle.

4,074,468
APPARATUS FOR THE CONTINUOUS ON-TRACK TRUING OF RAILWAY RAILS

Romolo Panetti, 24 Parc Chateau Banquet, Geneva, Switzerland

Filed July 14, 1975, Ser. No. 595,685
Claims priority, application Switzerland, Jan. 13, 1975, 337/75
Int. Cl.[2] B24B *23/00*
U.S. Cl. 51—178 2 Claims

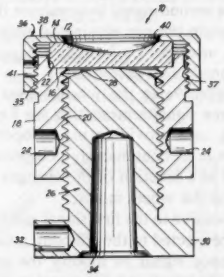


1. Apparatus for the continuous on-track alignment of railway rails, said apparatus comprising a plurality of contact elements constituting points of support of the apparatus on the rail, means dividing the contact elements into three longitudinally aligned groups capable of each moving by itself and parallel to one another, means associated with said groups for causing the same to exert predetermined pressure on the rail which is to be aligned, the contact elements in at least the first of said groups being fixedly arranged therein on a common support and means hingably connecting said groups together so that they are constrained to move parallel to one another, the first group having two contact elements which are abrasive grinding elements, the third group having two contact elements which are abrasive grinding elements, the second group being interposed between the other two groups of abrasive elements and having two contact elements so that between the two abrasive elements of the two groups there is always one contact element.

4,074,469
APPARATUS FOR MANUFACTURING LENSES

Benjamin Nuchman, 820 Birchwood Drive, Westbury, N.Y. 11590, and Sang Y. Whang, 8445 SW. 148th Drive, Miami, Fla. 33143

Division of Ser. No. 440,882, Feb. 8, 1974, abandoned. This application June 26, 1975, Ser. No. 590,648
Int. Cl.[2] B24B *41/06*
U.S. Cl. 51—217 L 10 Claims

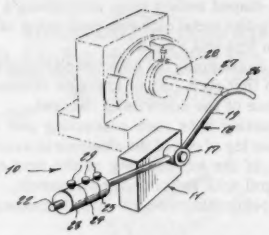


1. A tool for forming a lens from a lens blank having an axial region and a periphery, comprising means for holding said lens while providing access to the opposed sides thereof passing through the axis of said lens blank and means for applying distorting force along said axis to one of said sides of said lens blank for axially displacing the axial region of said blank relative to all points on the periphery of the blank, said holding and distorting means including a body member having an axial bore therethrough terminating in an end wall formed with an axial aperture therethrough, said end wall defining a seat for receipt of said blank within said bore, a plunger dimensioned for receipt within said bore for applying said distorting force, thread means on the bore of said body and said plunger member for application of said distorting force upon the rotational displacement of said plunger member, jig means for fixedly supporting said body member and including a rotatable member for engaging said plunger member for selective rotation thereof, and means for measuring the displacement of the axial region of said lens blank in response to said distorting force, said measuring means including micrometer means having a displaceable plunger for effecting measurement and means supporting said micrometer means with said plunger axially aligned with respect to said axial bore of said body member and positioned for engagement against said lens blank.

4,074,470
ANTI-CHATTERING, GRINDING COUNTERBALANCE DEVICE

Nicola Lore, 35 Burkhardt Ave., Bethpage, N.Y. 11714

Filed Jan. 3, 1977, Ser. No. 755,953
Int. Cl.[2] B24B *41/06*
U.S. Cl. 51—238 S 1 Claim



1. An anti-chattering, grinding, counterbalance device, comprising in combination, a heavy base block supporting pivotally free a rocking lever, one end of said rocking lever adjustably supporting a plurality of counterbalancing weights while an opposite end of said rocking lever bears against a side surface of a free end of a work supported at its other end in a chuck during a grinding operation; a screw secured to a side of said base block having a shoulder around which said rocking lever pivots; said rocking lever being comprised of a collar pivoted around said screw shoulder, a pair of rods secured radially to said collar a first said rod being straight throughout its length and on which said weights are supported, and the other said rod having an accurate end being all on a flat plane that is at right angle to a longitudinal axis of said screw; each said weight being securable on said rod by a set screw.

4,074,471
PROCESS FOR NUCLEATING DIAMONDS

Rangachary Komanduri, and Milton C. Shaw, both of Pittsburgh, Pa., assignors to Carnegie-Mellon University, Pittsburgh, Pa.

Continuation of Ser. No. 514,394, Oct. 15, 1974, abandoned. This application Feb. 13, 1976, Ser. No. 657,891
Int. Cl.[2] B01J *3/06;* C01B *31/06*
U.S. Cl. 51—295 4 Claims

1. A process for nucleating diamonds in the absence of a pressure vessel which comprises:

(a) depositing a mixture of a metal solvent catalyst for forming diamond from graphite and graphite on an abrasive

grain which provides a hard substrate which is at least as hard as tungsten carbide; and

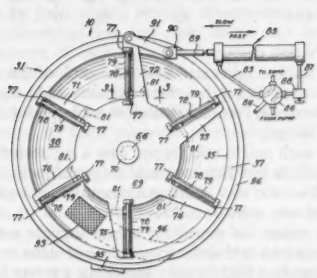
(b) subjecting the coated abrasive grain to a grinding action with a work material which produces the necessary temperature and pressure to form diamond.

4,074,472

IMPROVED FINISHING METHOD

Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Kalamazoo, Mich.

Division of Ser. No. 573,906, May 2, 1975, Pat. No. 4,012,869. This application Nov. 1, 1976, Ser. No. 737,382
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—313 **8 Claims**



1. A process for finishing a part or parts while preventing contact engagement between said parts which comprises:

(1) maintaining said part or parts and a finishing material in a finishing chamber, each part or group of parts arranged in a compartment defined by a pair of partitions oriented substantially transversely to the walls of said chamber,

(2) applying vibratory motion to said chamber to cause said part or parts to be finished and to move along said chamber,

(3) moving one of said partitions and said finishing chamber with respect to the other in a first direction, corresponding to the direction in which said part or parts move, for a limited distance while said partitions are arranged in positions intermediate said parts for isolating said parts,

(4) moving said partitions from said positions intermediate said parts to new and out-of-the-way positions not intermediate said parts thereby to permit said partitions and said parts to move past one another,

(5) moving the same one of said partitions and said finishing chamber with respect to the other in a second direction in a reverse or backward relationship to said first direction, the movements defined under steps 3) and 5) being reciprocating movements,

(6) returning said partitions to positions which are intermediate said parts, and

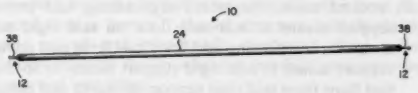
(7) separating said parts from said finishing material.

4,074,473

CONTROLLED THERMAL EXPANSIVITY STRUCTURE

Paul T. Nelson, Rolling Hills Estates, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jan. 2, 1975, Ser. No. 537,980
Int. Cl.[2] E04C *3/00*
U.S. Cl. 52—1 **10 Claims**



1. A controlled thermal expansivity structure comprising:

first, second, and third elongate members aligned parallel to a common axis;

first connecting means joining one end of said first member and one end of said second member for relative endwise adjustment of said latter members along said axis and securing said latter members against relative endwise thermal expansion and contraction at a fixed transverse plane of said first member;

second connecting means joining the other end of said second member and one end of said third member for relative endwise adjustment of said latter members along said axis and securing said latter members against relative endwise thermal expansion and contraction at a fixed transverse plane of said second member;

said first member extending from said one end toward said other end of said second member and said third member extending from said other end toward said one end of said second member;

said second and third members having differing thermal coefficients; and

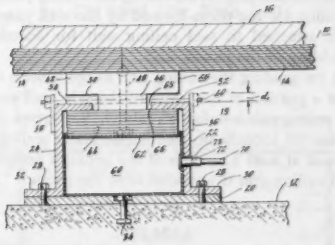
said first and second members and said second and third members being independently relatively adjustable after assembly of the several members to adjust the overall length of said structure and to adjust selectively the effective coefficient of thermal expansion of said structure at any length within a given range of said length adjustment through a range including positive, negative, and zero coefficient values.

4,074,474

FLOOR SUPPORT ARRANGEMENT

Nicholas G. Cristy, 9 S. View Ave., Pleasantville, N.Y. 10570

Filed Oct. 8, 1975, Ser. No. 620,767
Int. Cl.[2] E04D *15/00*
U.S. Cl. 52—2 **18 Claims**



1. An improved floor support arrangement for theatrical, dancing and athletic activities comprising:

A. a base platform having a surface thereof;

B. a floor;

C. rigid support means positioned between said base platform surface and said floor for rigidly supporting said floor above said base surface;

D. an inflatable pneumatic support means positioned between said base platform surface and said floor for vertically displacing and resiliently supporting said floor above said rigid support means, said pneumatic support means substantially enclosed by said rigid support means;

E. said rigid support means adapted for receiving and supporting a floor load transferred thereto from said inflated pneumatic support means; and

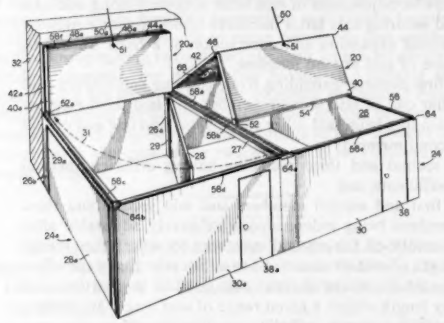
F. control means for selectively causing said pneumatic support means to seat said floor on said rigid support means for transferring said floor load from said pneumatic support means to said rigid support means or to displace said floor from said rigid support means to said pneumatic support means whereby said floor is alternatively rigidly or resiliently supported.

4,074,475

COLLAPSIBLE ROOM MODULE CONSTRUCTION AND METHOD OF ASSEMBLY

Carl D. Wahlquist, Woodland Hills, Calif., assignor to Building Components Research, Inc., Los Angeles, Calif.

Filed Jan. 28, 1977, Ser. No. 763,437
Int. Cl.[2] E04B *1/343*
U.S. Cl. 52—70 **17 Claims**



1. In an improved building structure for a collapsible room module usable for selectively transforming a large space into smaller spaces and having an assembly of generally vertically-oriented foldable front, rear and side wall panels for forming a room, the improvement comprising:

a foldable ceiling unit having at least two ceiling panels hinged together to accommodate (a) folding at least one of the ceiling panels with respect to the other into a storage configuration and (b) unfolding the ceiling panels to form a ceiling for the room formed by the wall panels;

wheels attached to said ceiling unit for accommodating unfolding of the panels; and

means for guiding the ceiling unit as the wheels traverse at least a portion of the edges of the side wall panels when the ceiling unit is unfolded, said guiding means comprising means for acoustically and hermetically sealing the room around at least a portion of the ceiling's periphery when said ceiling unit is unfolded onto the room.

4,074,476

TUBULAR DWELLING CONSTRUCTION

Imanol Ordorika, Cantil No. 175, Jardines del Pedregal, Mexico City, Mexico

Continuation of Ser. No. 480,553, June 17, 1974, abandoned. This application Dec. 2, 1975, Ser. No. 636,970
Int. Cl.[2] E04B *1/348*
U.S. Cl. 52—79.2 **10 Claims**

1. A plurality of tubular dwellings arranged in a stacked configuration, each of said dwellings have side walls integrally cast with an upper segment and a lower segment to form a self-supporting modular unit, each of said units comprising:

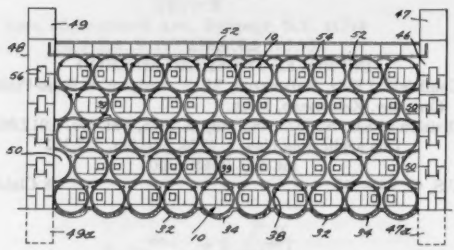
a. an interior floor and ceiling also integrally cast or formed with said side walls and said upper and lower segments, at least a portion of ceiling and said upper segment providing for an upper internal chamber for containing water or the like, said floor and said lower segment providing for a lower internal chamber for containing sewage or the like;

b. means arranged on said upper segment for feeding water or the like through an inlet into said upper internal chamber;

c. means arranged on said lower segment for draining sewage or the like from said lower internal chamber; and

d. a plurality of supporting ledges disposed along an exterior surface of said unit;

wherein a first bottom row of said units are placed side-by-side, said units being supported upon a foundation of a gravel bed or the like in a plurality of ditches in the ground, at least a second and a third row of said units



being stacked upon said first row, each of the even-numbered rows being provided at both ends thereof with complementary rooms which complete said even-numbered rooms,

wherein each unit in said second row is supported by two of said units in said first row, said ledges of each of said units in said second row abutting against corresponding ledges on said two units in said first row,

wherein means for providing lateral support are arranged proximate to said units to secure said units in a stacked configuration said means comprising a tower adjacent to each end of said rows, each of said towers being embedded into the ground, the arrangement including precast arches bridged across the upper segments of each side-by-side unit in the uppermost row of said stacked configuration, and an upper floor disposed against said precast arches and against said upper segments of said uppermost row of units, each of said units being provided with a ventilating means.

4,074,477

MODULAR BUILDING STRUCTURE

John F. Runyon, 91 Kent St., Apt. 4, St. Paul, Minn. 55102

Continuation-in-part of Ser. No. 145,768, May 21, 1971, abandoned. This application Sept. 17, 1973, Ser. No. 397,765
Int. Cl.[2] E04B *1/32*
U.S. Cl. 52—86 **15 Claims**

1. A modular building structure of configuration approximating the surface generated by regular, uniform movement of a plane curve, said structure comprised of:

(A) a plurality of interconnected basic structural modules of alternately repeating right and left handed (mirror image) form, each right handed module being adjacent to a left handed module and adjacent modules interconnected side to side along a boundary interface;

(B) a series of limit planes defining the two furthermost module sides and the boundary interface between adjacent modules, each plane equally displaced from the next;

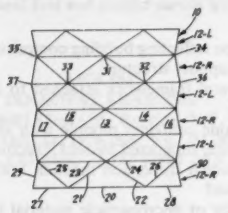
(C) each module being comprised of a plurality of intercon-

nected hinged rigid structural components, each component being hingedly connected to at least two other components, parts of said components lying in said limit planes;

(D) those parts of the module components lying in one limit plane being serially connected to form one side of a module, making an approximation of a plane curve determining the contour of the building structure; those parts on the oposite side of the same module lying in the next adjacent limit plane being serially connected to form the opposite side of the module, making a different approximation of the same plane curve;

(E) other parts of said components occupying the three dimensional space between two adjacent limit planes extending between and interconnecting said parts of the components which form said two different approximations of plane curves;

(F) the parts of said components lying in said limit planes being constrained from moving outside their respective



planes by pairs of said module components connected at and symmetrical left and right about said limit planes, components of each right hand module paired with like components of each left hand module;

(G) the parts of said components lying at the ends of said modules defined by the end tips of said plane curve, being connected to fixed supports constraining said parts to fixed points;

(H) a single module being made rigid and determinate according to the rules of structural analysis, with the constraints to be contributed by its mirror image adjacent modules replaced by the condition that neither side of the single module is permitted to deflect out of a plane;

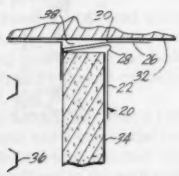
(I) the structure composed of a plurality of said modules being made rigid and determinate by the action of each module constraining the sides of adjacent modules not to deflect out of said limit planes, by said two furthermost module sides being connected to fixed planar supports, and by said module ends being connected at fixed support points.

4,074,478

DRYWALL BEAD ACCESSORY

Barry A. Rutherford, 10008 Forbes, Sepulveda, Calif. 91343

Filed Mar. 8, 1976, Ser. No. 664,481
Int. Cl.² E04B 5/57
U.S. Cl. 52—98 **5 Claims**



1. A drywall casing bead comprising:

a first flat elongated strip adapted to overlie the surface of the drywall;

a lip formed along one elongated edge of said first strip to provide a bead for the application of masking materials;

a second flat elongated strip extending from the side of the lip opposite said first strip at approximately right angles to said first strip, the second strip being adapted to be inserted in a space between the edge of the drywall and an adjacent surface; and

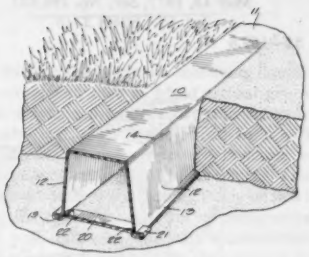
a third flat elongated strip, integral with said second strip, extending from the lip in the opposite direction from said second strip to form a T-shaped structure, said third strip being scored and intentionally weakened along a line directly opposite the lip whereby the third strip provides a removal tear strip.

4,074,479

LAWN EDGING

Richard W. Krupka, 2747 Donegal Road, Racine, Wis. 53405

Filed Apr. 25, 1977, Ser. No. 790,364
Int. Cl.² A01G 1/00; E01C 11/22
U.S. Cl. 52—102 **8 Claims**



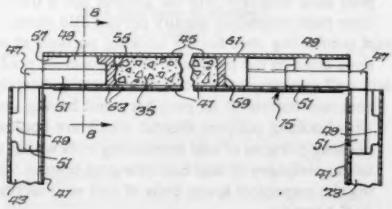
1. A lawn edging comprising linear box sections having a top wall and two side walls wherein the novelty comprises side walls that are straight in lateral cross-section and inclined between about 10° and 30° to a vertical plane to form an isosceles trapezoid with said top wall and an underlying surface, outwardly directed flanges at the bottom of each side wall, and a plurality of clips, each said clip having an inwardly directed channel at each end to receive a said outwardly directed flange and an outwardly directed abutment engageable with the inner margin of the flange to retain the flange in the channel.

4,074,480

KIT FOR CONVERTING SINGLE-GLAZED WINDOW TO DOUBLE-GLAZED WINDOW

Henry W. G. Burton, 161 St. James Place, Buffalo, N.Y. 14222

Filed Feb. 12, 1976, Ser. No. 657,376
Int. Cl.² E04B 1/66; E06B 7/12
U.S. Cl. 52—127 **5 Claims**



1. A kit of components for converting a single-glazed window into a double-glazed window which comprises a plurality of elongated spacing side members of tubular shape adapted to be assembled together at the ends thereof to form a spacing frame to fit about the periphery of the single-glazed window, at least one of said members having an opening in a wall communicating with the interior of such assembled frame, a desiccant

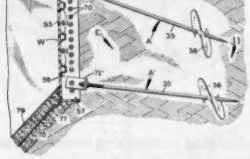
inside such member, sealant in said member sealing off the desiccant therein so as to prevent contact between it and moisture in air except through the opening communicating with the interior of the assembled frame when said opening is not closed off, and readily removable tape sealing means closing off said opening.

4,074,481

IN-GROUND SWIMMING POOL CONSTRUCTION

Robert S. Lang, Tampa; Rodney Morris Post, Largo, and Thomas Leo Hogan, Tampa, all of Fla., assignors to L. F. Lang & Son Pools Inc., Tampa, Fla.

Division of Ser. No. 687,537, May 18, 1976. This application May 13, 1977, Ser. No. 796,527
Int. Cl.[2] E04H *3/16*
U.S. Cl. 52—169.8 **3 Claims**



1. In an in-ground swimming pool construction which includes a swimming pool shell structure having substantially rigid, pre-formed plastic sides received in an excavation and spaced by backfill from the ground thereat, the sides of the shell structure comprising horizontally and vertically reinforced rigid individual wall sections connected end-to-end, a concrete pool bottom extending across the bottom of the excavation at the lower end of said pool shell structure, and reinforcing rods embedded in said concrete pool bottom and extending therein to locations close to its periphery, the improvement comprising:

a plurality of ground anchors embedded in the ground at the sides of the pool shell structure in said excavation;

said ground anchors comprising auger-type anchors each having an elongated, rod-like, rigid, central stem extending transversely outward from the adjacent side of the pool shell structure into the ground and a transverse anchor plate extending spirally around said stem;

said reinforcing rods having hooking portions at said locations close to the periphery of the concrete pool bottom;

said wall sections at their lower ends resting directly on said concrete bottom at its periphery and having connectors with hooking portions thereat which are hooked to said hooking portions of said reinforcing rods within and close to the periphery of said concrete pool bottom for anchoring the respective lower ends of said wall sections to the pool bottom;

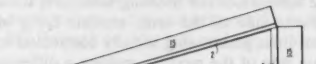
and a plurality of adjustable connector means operatively connecting the sides of the pool shell structure to the adjacent ends of the corresponding ground anchor stems for lateral adjustment of the respective sides while the hooking portions at their lower ends remain hooked to the corresponding hooking portions of the reinforcing rods in the concrete pool bottom.

4,074,482

RADIATION REFLECTING BUILDING

Carl N. Klahr, 678 Cedar Lawn Ave., Lawrence, N.Y. 11559

Filed Jan. 9, 1976, Ser. No. 647,934
Int. Cl.[2] B32B *1/05*
U.S. Cl. 52—171 **37 Claims**



1. A radiation reflecting building comprising in combination:

(a) a basic support structure,

(b) a structural framework attached to said basic support structure,

(c) at least one container module with at least one translucent surface, supported by said structural framework,

(d) a translucent dispersion medium within said container module, and

(e) a quantity of microparticle material in the form of microparticles dispersed within said dispersion medium, wherein the index of refraction of the microparticle material differs substantially from that of said dispersion medium and wherein the microparticle material has a ratio of optical absorption coefficient to optical scattering coefficient of less than 0.2, and

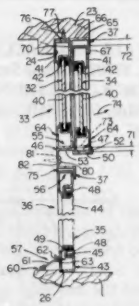
wherein the concentration of microparticles in the dispersion medium and the container internal dimension perpendicular to said container surface provide an optical path length through said dispersion medium layer of at least four scattering lengths.

4,074,483

APPARATUS FOR HOLDING PANELS IN A WINDOW CONSTRUCTION

Donald E. Vickstrom, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Feb. 14, 1977, Ser. No. 768,069
Int. Cl.[2] E06B *3/28*
U.S. Cl. 52—202 **18 Claims**



1. In a window construction comprising; peripheral framing members including an upper member having a vertically disposed supporting surface, a lower member having a vertically disposed supporting surface, and a pair of spaced parallel side members connected between opposite ends of said upper and

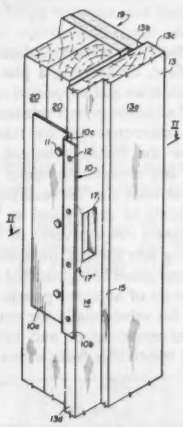
lower members with each side member having a vertically disposed supporting surface, said peripheral framing members defining an opening in said construction with said vertical surfaces being disposed in a common plane; a plurality of three panels disposed within said opening; and means holding said panels within said opening; the improvement wherein said holding means comprises; a horizontally disposed rail having a substantially U-shaped channel for receiving a lower end portion of a first panel therewithin, said U-shaped channel being defined by a horizontal bight and a pair of vertically disposed legs including an inner leg and an outer leg extending from opposite ends thereof, an extension extending horizontally from a central part of said inner leg, said horizontal extension cooperating with a portion of said inner leg thereabove to define a first L-shaped channel for receiving a second of said three panels therewithin, said rail also having a second L-shaped channel disposed beneath said first L-shaped channel and adapted to receive a third panel therewithin; and at least one substantially F-shaped clip adapted to engage and hold upper portions of said first and second panels within said opening.

4,074,484

DOORWAY FRAMING

James Queren, 218-07 43rd Ave., Bayside, N.Y. 11361

Filed Oct. 12, 1976, Ser. No. 731,304
Int. Cl.² E05C *21/00*; E06B *1/04*
U.S. Cl. 52—214 **7 Claims**



1. A doorway framing comprising, in combination:

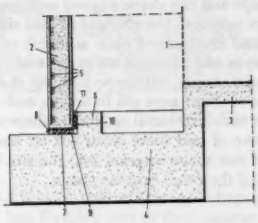
1. a wooden door frame side rail having two substantially parallel major faces and two minor faces substantially perpendicular to the major faces, one of the major faces having a recessed end portion delimited by one of the minor faces and a shoulder constituting a stop for a door, and the door frame side rail defining a door latch bolt hole in the recessed end portion,
2. a wall including wooden wall stud means adjacent the other major face of the door frame side rail, the door frame side rail being mounted on the wall and the minor faces of the door frame side rail extending substantially parallel to the wall, and
3. a reinforcement plate extending over a substantial portion of the wall stud means and a substantial portion of the one minor face of the door frame side rail, the reinforcement plate being securely affixed to the wall stud means and the one minor face of the door frame side rail and covering a substantial region of the minor door frame side rail face adjacent and beyond the door latch bolt hole, the securely affixed plate holding the side rail of the wooden door frame firmly in position.

4,074,485

SAFETY WALL FOR A STORAGE TANK

Nicolaas Arie Hendriks, Rotterdam, Netherlands, assignor to Bouwmaatschappij Nederhorst B. V., Gouda, Netherlands

Continuation of Ser. No. 631,849, Nov. 13, 1975, abandoned. This application Apr. 27, 1977, Ser. No. 791,466
Claims priority, application Netherlands, May 13, 1975, 7505591
Int. Cl.² E04G *11/06*
U.S. Cl. 52—224 **2 Claims**



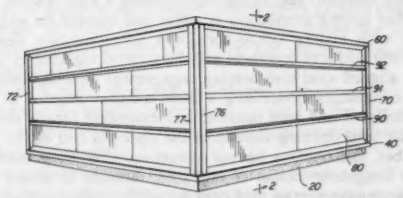
1. A safety wall for a storage tank containing liquids dangerous to the environment, such as liquid natural gas, acrylonitrile, ammonia, ethylene, propylene, propane and hydrocyanic acid compounds, said safety wall formed by a cylindrical, circumferentially closed and prestressed concrete wall surrounding the tank with relatively small interspace, a horizontal supporting floor, said safety wall resting freely on said horizontal supporting floor, tensioning wires circumferentially prestressing said wall, tubes in said wall accommodating said tensioning wires which do not bond to the concrete, a circular supporting floor on which said safety wall rests adjacent a centering ring formed by an elevation of said circular supporting floor concentrically within said safety wall and surrounding the tank with small interspace, and elastically deformable sealing material being arranged between the lower end of the safety wall and the adjoining surfaces of both the wall supporting floor and said ring, said circular supporting floor being supported independently of the supporting floor of the tank, a circular floor bridging the spacing between the circular supporting floor and the tank supporting floor, said circular floor being laid with some freedom of movement on the circular wall supporting floor and the tank supporting floor.

4,074,486

PANEL WALL CONSTRUCTION

Kenneth R. Grearson, Park Ridge, Ill., assignor to Multuloc Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 625,147, Oct. 23, 1975, Pat. No. 3,974,608. This application July 20, 1976, Ser. No. 705,472
The portion of the term of this patent subsequent to Aug. 17, 1993, has been disclaimed.
Int. Cl.² E04B *2/38*
U.S. Cl. 52—235 **9 Claims**



1. A panel wall construction of the type having alternating panels and panel carrying structural members comprising:

horizontal spaced sheet metal structural shapes of generally box-tee having three adjacent box walls, the fourth box wall being split into two segments, opposing legs extending away from the box section at about 90° from the ends of the split box walls for a distance to accommodate desired panels, the outer end of said legs extending away from each other forming flanges at about 90° to said legs and forming a channel to accept the edges of a wall panel;

lower sill sheet metal structural shape having the same design as said spaced shapes;

upper cap sheet metal structural shape having the same design as said spaced shapes;

said sill shape and cap shape aligned with said spaced shapes to accept panels in the channel of said sill and cap shape;

panels in said channels of each adjacent said spaced structural shapes and adjacent sill shape and cap edge locking said spaced shapes, sill shape and cap shaped into a rigid structure without separate fasteners; and

vertical corner sheet metal structural shape assemblies comprising two of said sheet metal box-tee shapes having one flange of one shape inserted into the slot between opposing legs of the other box-tee shape.

4,074,487

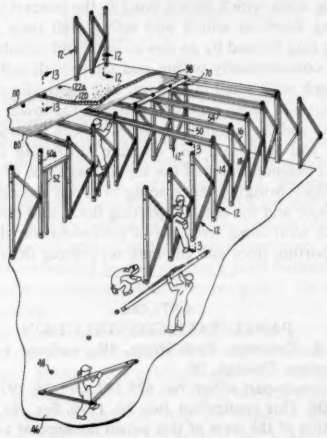
MULTI-STORY WALL FRAMING SYSTEM AND METHOD

Lawrence H. Daniels, Piedmont; Murray C. Hood, and Boguslaw Burdzinski, both of Oakland, all of Calif., assignors to Kaiser Steel Corporation, Oakland and Custom Rolled Corrugated Metals Co., Albany, both of Calif.

Filed Jan. 28, 1974, Ser. No. 436,894

Int. Cl.[2] E04C *3/04;* E04H *12/10*

U.S. Cl. 52—236.3 **11 Claims**



1. A frame element adapted to be assembled in combination with a plurality of like elements to form a composite framework for a building wherein said elements comprise the vertical load carrying structure of the framework and the lateral bracing therefor, said element comprising a load bearing stud member having connectors at either end thereof for engagement with mating connectors of a corresponding element whereby said stud members may be secured together in vertically aligned axial load bearing engagement with one another, said connectors comprising a male member secured at one extremity of said stud member and extending axially thereof and an axial opening formed in the opposite end of the stud member, said opening having a cross-sectional shape substantially congruent to that of said male member to afford telescopic engagement in said opening of the male member of a corresponding element; upper and lower obliquely extending brace members, said brace members having first ends secured to said stud members adjacent the respective extremities thereof and second ends joined to one another in spaced relationship to said stud member at a junction point intermediate the upper and lower extremities of the stud member, said brace members having attachment affording means at the second ends thereof for engagement with the stud member of an adjacent corresponding frame element whereby said brace members may horizontally brace the stud member of such an adjacent frame element.

4,074,488

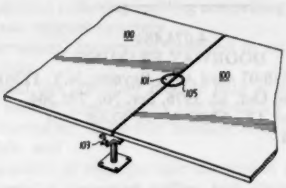
ELEVATED FLOOR ASSEMBLY

George F. Ray, III, Rockville, Md., assignor to Liskey Architectural Mfg. Inc., Glen Burnie, Md.

Division of Ser. No. 476,543, June 5, 1974, Pat. No. 3,943,674, which is a continuation-in-part of Ser. No. 306,417, Nov. 14, 1972, abandoned. This application Dec. 19, 1975, Ser. No. 642,259

Int. Cl.[2] E04F *15/024*

U.S. Cl. 52—263 **10 Claims**



1. An elevated false floor assembly of panels having a level and even tread surface, comprising a plurality of panels arranged side-by-side in rows and supported on pedestals at their corners, the sides of adjacent panels substantially abutting one another and being interconnected by releaseable tie means located intermediate the corners thereof, said panels each being load bearing and comprising upper and lower spaced apart metal sheets, at least one tie securing the spaced apart upper and lower sheets of each panel to the corresponding upper and lower sheets respectively, of an adjacent panel adjacent each abutting side thereof, the horizontal and vertical movements of any one panel being resisted and shared by said upper and lower sheets of adjacent panels, said tie extending generally vertically for substantially the entire panel thickness between said spaced apart upper and lower sheets of that panel, said tie being removable from above the tread surface.

4,074,489

WALL PANEL ASSEMBLY

Alan Eckel, Westford, Mass., assignor to Eckel Industries, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 643,698, Dec. 13, 1975. This application Sept. 27, 1976, Ser. No. 727,034

Int. Cl.[2] E04B *1/00*

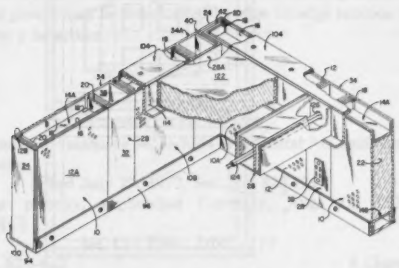
U.S. Cl. 52—272 **19 Claims**

1. A modular wall assembly comprising in combination:

at least first and second panels with each of said first and second panels including a substantially flat body and a tongue at one edge of said body extending substantially parallel to and spaced from said body so as to form a first channel therebetween, said first and second panels being aligned and oriented so as to form a corner,

a first connector member disposed between said first and second panels, said first connector member having first and second side flanges extending transversely to one another, said first side flange extending within the first channel of said first panel and making a snug fit with the adjacent tongue and body of said first panel and the said second side flange being spaced from said body of said first panel and extending substantially parallel to the plane of said body so as to form a second channel therebetween;

a second connector member disposed between said first and second panels, said second connector member having two parallel spaced-apart side plates and a web connected to and supporting said side plates, one of said side plates extending within the first channel of said second panel and making a snug fit with the adjacent tongue and body of said second panel, and the other of said side plates extending within said second channel and making a snug fit with



the adjacent second side flange of said first connector member and the body of said first panel; and

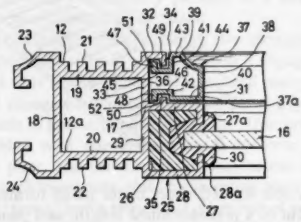
a third connector member disposed between said first and second panels, said third connector member fhaving two parallel spaced-apart side plates and a web connected to and supporting said side plates, the side plates of said third connector extending between and making a snug fit with said tongue of said second panel and said second side flange of said first connector member.

4,074,490

DECORATIVE WINDOW SASH FRAME ASSEMBLY

Mitsuo Nagase, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jan. 24, 1977, Ser. No. 762,052
Claims priority, application Japan, Jan. 23, 1976, 51-7027[U]
Int. Cl.² E06B 1/18
U.S. Cl. 52—312 **3 Claims**



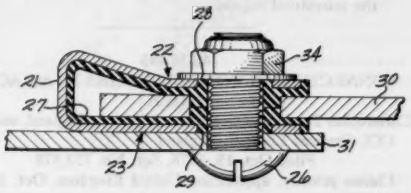
1. A window sash frame assembly for peripherally holding a panel member comprising: a rectangular frame having a raised decorative pattern on its interior surface, said frame having a pair of inwardly opening, continuous interior and exterior channel sections formed around the inner periphery of said frame and defining spaced channels, said interior channel section having a retaining means, and said exterior channel section being adapted to receive and hold the peripheral edge of the panel member at both sides thereof in one of said channels; and a decorative attachment means extending along the interior channel section and disposed in part only in the other of said channels, said decorative attachment means having an engagement means engaging said retaining means to detachably retain said decorative attachment means in spaced relation relative to said one channel.

4,074,491

CLIP SHOCK MOUNT

Graham Elsworth Bell, Renton, and Alden Bernard Winters, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 26, 1976, Ser. No. 735,655
Int. Cl.² E04B 1/62
U.S. Cl. 52—394 **8 Claims**



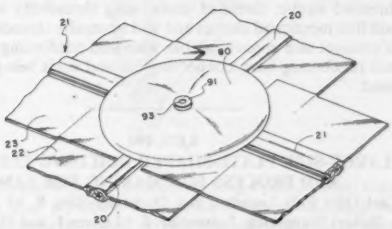
1. A clip shock mount, comprising: a U-shaped metal band having a pair of legs forming part of the U-shape; the free end of each of the legs having an aperture and said apertures being in alignment; a resilient material fixedly attached to the inner surface of the U-shaped metal band; and said resilient material having an integrally formed bushing, within each of the apertures, with a collar of resilient material extending inwards of the U-shaped metal band.

4,074,492

PREFABRICATED WATERTIGHT STRUCTURAL SYSTEM

Harold G. Simpson, and Michael W. Davis, both of Oklahoma City, Okla., assignors to Star Manufacturing Co. of Oklahoma, Oklahoma City, Okla.

Filed Dec. 31, 1975, Ser. No. 645,565
Int. Cl.² E04B 2/08
U.S. Cl. 52—419 **8 Claims**



1. A prefabricated roofing system comprising:

a group of panels contiguously arrayed in side-by-side and end-to-end abutting, junction-defining relationship on a supporting substructure, each panel including

a first sheet metal member;

a second sheet metal member spaced from the first sheet metal member and disposed substantially parallel thereto;

a body of foam insulation substantially filling the space between and bonded to the first and second sheet metal members;

a thin, flexible, elastomer membrane extending over and being substantially continuously bonded to the first sheet metal members for forming a fluid-tight covering over the array of panels;

an extruded elastomer fastener connecting each edge of each of said membranes, said fasteners having end portions coverging towards each other defining an interstitial region at the junction of a plurality of said membranes; and,

apparatus forming a sealed connection between said con-

verging end portions, said apparatus including a first plate disposed below said fasteners, a second plate disposed above said fasteners, said first and second plates each having an interior side surface which overlaps said converging end portions, a viscous, adhesive sealing material the constituent particles of which flow in response to pressure applied to the interior side surface of at least one of said plates, and means clamping said plates together to cause the sealing material to flow between the plates into the interstitial region.

4,074,493

CONNECTING REINFORCING BARS IN AN ACCESS HOLE

Christopher David Outram, Thames Ditton, England, assignor to CCL Systems Limited, England

Filed Oct. 15, 1976, Ser. No. 732,578

Claims priority, application United Kingdom, Oct. 15, 1975, 42357/75

Int. Cl.² E04C *1/10*

U.S. Cl. 52—583 **8 Claims**

1. In a structure comprising a pair of concrete bodies strengthened with reinforcing bars, said bodies having an access hole formed therebetween, with said reinforcing bars terminating adjacent said access hole, and being aligned on opposite sides of said access hole, the improvement comprising a sleeve secured on the end of each reinforcing bar adjacent said hole, each of said sleeves being internally threaded and being in communication with said access hole, a connecting bar having a length slightly less than the width of said hole and being positioned between the ends of said reinforcing bars, said connecting bar being provided at each end with an internally threaded sleeve, threaded studs being threadedly secured in said first mentioned sleeves and said internally threaded sleeves to connect said connecting bar with said reinforcing bars, and said reinforcing bars, connecting bar and studs being in alignment.

4,074,494

LARGE-SIZE PLATE-SHAPED BUILDING ELEMENTS AND PROCESS FOR MAKING THE SAME

Carl Otto Pels Leusden, von Ossietzky-Ring 8, 43 Essen 14; Robert Stupperich, Janssenstr. 5, 43 Essen 1, and Hans-Bernd Weber, Lunerkamp 20, 43 Essen 13, all of Germany

Filed Dec. 13, 1974, Ser. No. 532,549

Claims priority, application Germany, Dec. 13, 1973, 2361945

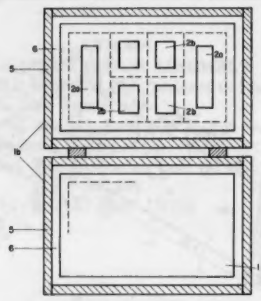
Int. Cl.² E04C *2/04*; C04B *33/30, 33/32*

U.S. Cl. 52—606 **12 Claims**

1. Plate bricks made of ceramic material in the shape of plates or boards, so as to achieve uniform shrinkage and avoid shrinkage differences, and cracking, or deformation during drying comprising a plurality of adjacent parallel groups of pipes forming a unitary element wherein said groups of pipes comprise at least one pipe, and each of said plurality of groups of pipes have the same hydraulic diameter and the same wall thickness, and made in accordance with the process comprising the steps of:

(a) forming wet ceramic material into a monolithic body or blank subdivided into and containing members each having walls surrounding a plurality of open-end parallel tubular passages of approximately the same hydraulic cross-section, each said walls having substantially the same and a constant and uniform thickness, said passages being separated by common walls;

(b) passing drying air solely through said passages at a temperature and velocity effective to reduce the moisture content evenly over the entire cross-section of the formed body while avoiding deformation or crack formation, and the hydraulic cross-sections together with the wall thickness effecting an even drying of the cross section when said dry air is passed through said passages;



(c) preventing drying of the outer surfaces while simultaneously passing said drying air solely through said passages by maintaining thereon a covering layer of waterproof and steamproof material; and

(d) burning the dried building element.

4,074,495

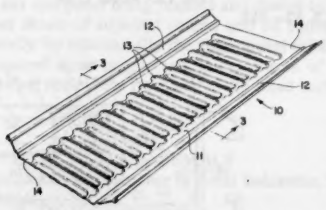
SHEET METAL PANEL

Ernest Robert Bodnar, 29 Blackdown Crescent, Islington, Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 580,709, May 27, 1975, Pat. No. 4,027,517, which is a continuation-in-part of Ser. No. 431,098, Jan. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 311,703, Dec. 7, 1972, abandoned. This application Aug. 25, 1976, Ser. No. 717,658

Int. Cl.² E04C *2/32*

U.S. Cl. 52—613 **2 Claims**



1. A roll formed sheet metal panel formed of strip sheet metal cut to a predetermined length, said panel comprising;

a central portion and two side portions;

continuous roll formed longitudinal fold formations extending continuously along both side portions of said panel running from one end to the other thereof without interruption;

a plurality of identical transverse ridges and indentations of continuous sinusoidal shape in elevation formed in the central portion of said panel, along a length less than the length of said panel, and extending from side to side of said central portion between said longitudinal fold formations, and terminating just short of said longitudinal fold formations;

flat planar junction portions of said central portion at each end of said panel extending from side to side of said central portion between said longitudinal fold formations wherein said transverse ridges and indentations are absent, and

being flanked by said longitudinal fold formations on either side thereof, said transverse ridges and indentations having upper and lower extremities, the lower extremities of said indentations lying in a common plane with a plane containing said planar junction portions, and said indentations extending to one side only of said plane, and exhibiting compound concave and convex curved contours characterized by an absence of flat sections and sharp angles, and complementary continuous lengthwise mating formations formed in said longitudinal fold formations, whereby said panels may be interlocked in edge to edge relation to form a structure.

4,074,496

COMPOSITE PLATE

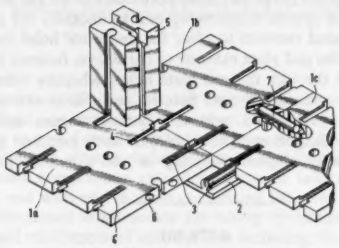
Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3 (Tumlingen), Germany

Filed July 29, 1977, Ser. No. 820,129

Claims priority, application Germany, Aug. 12, 1976, 7625293[U]

Int. Cl.² E04C *2/00, 1/10*

U.S. Cl. 52—622 **8 Claims**



1. In an assembly kit of the type having a structural element provided with an undercut coupling projection, a combination comprising

at least two structural plates each having two undercut slots, said plates being adapted to be located adjacent to each other with at least one of said slots of each structural plate extending at least substantially parallel to a slot of the respective other structural plate; and

a plate-like connecting member having two elongated substantially parallel undercut projections each engageable in one of said slots of the respective structural plate so that, when said elongated undercut projections engage in respective slots of said structural plates, the structural plates are assembled with one another so as to form a large composite plate, and the structural element can be connected to such composite plate by inserting the coupling projection thereof into a respective other one of said slots.

4,074,497

UNDERWATER TRUSSES FOR BREAKWATER STRUCTURE

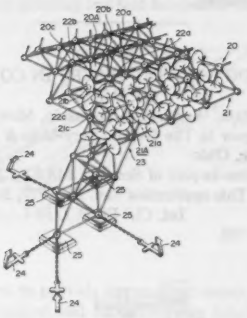
Taisaburo Ono, 2-2-39, Shinjuka, Zushi, Japan

Filed June 1, 1976, Ser. No. 691,612

Int. Cl.² E04G *7/20*

U.S. Cl. 52—648 **9 Claims**

1. Construction elements of underwater trusses for a breakwater structure comprising first and second co-linearly disposed, hollow web members having at opposite ends thereof engaging means and at adjacent ends thereof flanges extending perpendicular thereto, an annular plate disposed between said flanges, means for connecting said flanges and said annular plate together and hollow joint members engaged at the opposite ends of said hollow web members with said engaging means, a tension member extending through said hollow web



members and having ends extending into the hollow portions of said hollow joint members and fixedly connected therein.

4,074,498

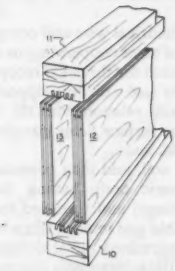
FABRICATED WOOD BEAM

James R. Keller, Tualatin, and William A. Nickerson, Portland, both of Oreg., assignors to Wm. A. Nickerson & Co., Ltd., Tualatin, Oreg.

Continuation-in-part of Ser. No. 558,350, March 14, 1975, Pat. No. 3,991,535. This application Nov. 5, 1976, Ser. No. 743,532

Int. Cl.² E04C *3/02*

U.S. Cl. 52—690 **4 Claims**



1. A fabricated wood beam comprising a pair of wood chord members and plywood web members interconnecting said chord members by means of glued tongue and groove joints, said web members comprising two sheets of plywood in face to face juxtaposition with the grain of the wood in the face veneers of both sheets running approximately perpendicular to the length of the chord members, each sheet having at least one intervening layer of veneer in which the grain of the wood runs approximately parallel with the length of said chord members, said face veneers projecting beyond said intervening layers on two opposite edges of said web members to form tongues on each of said opposite edges, longitudinal grooves in each of said chord members spaced apart to receive said tongues, said grooves in each chord member comprising a pair of outer grooves each having a width corresponding to the thickness of an outer face veneer on said web members to receive said outer face veneers, said outer grooves being inclined from top to bottom relative to each other to bend said outer face veneers on said web members out of parallelism with each other and form a self-locking dovetail type joint when said chord members are pressed onto said web members and said grooves including an intermediate groove having a width corresponding to the combined thickness of the adjacent face veneers on said web members to receive both of said

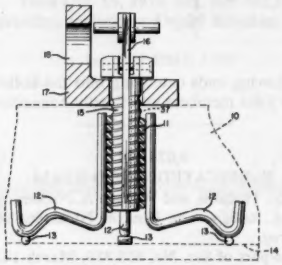
adjacent face veneers on said two web members, said bent outer face veneers holding all of said members together in assembled relation without external clamps while the glue in said joints is setting.

4,074,499

FILLER PLUG FOR COIL INSERT IN CONCRETE SLAB OR PANEL

Richard C. Mess, Washington Township, Montgomery County, Ohio, assignor to The Dayton Sure-Grip & Shore Company, Miamisburg, Ohio

Continuation-in-part of Ser. No. 648,521, Jan. 12, 1976, abandoned. This application Jan. 21, 1977, Ser. No. 761,263
Int. Cl.[2] E04B *1/38*
U.S. Cl. 52—705 **9 Claims**



1. A coil insert for temporary use in combination with a coil bolt of predetermined diameter on the bottom of a mold in the fabrication of a poured concrete slab of predetermined thickness, comprising:

(a) a substantially cylindrical wire coil composed of a predetermined number of turns cooperating to define an interior threaded surface sized for threaded reception of said bolt,

(b) means secured to said coil for supporting said coil in perpendicular spaced relation with the upper surface of the slab, said upper surface being parallel to said bottom surface of the mold, and

(c) a plug filing said coil, said plug consisting of

a hollow elastomeric body having the outer surface thereof proportioned and threaded for firm matching engagement within said interior threaded surface of said coil upon predetermined radial compression and axial expansion from the substantially unstressed condition of said elastomeric body, said plug having an unstressed diameter greater than said predetermined diameter of said coil bolt, said plug being open at the lower end thereof and closed at the upper end thereof, and

stem means, attached to said upper end of said plug, of sufficient strength for applying a pulling force to said plug causing sufficient elongation and radial contraction thereof for withdrawal from said coil and the slab after the slab has set to expose said threaded coil interior for reception of said bolt, said stem means being of a diameter less than said elastomeric body and proportioned to extend from said closed plug end beyond said slab surface.

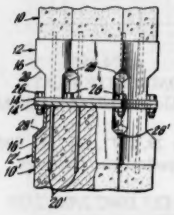
4,074,500

CONCRETE PILE COUPLING DEVICE

Guy Bisutti, 951 Montee de l'Eglise, Ile Bizard, Quebec, Canada

Filed Mar. 16, 1976, Ser. No. 667,349
Int. Cl.[2] E04C *3/30*
U.S. Cl. 52—726 **3 Claims**

1. A high strength pile coupling device for attaching concrete piles end to end, the device comprised of two identical joint members demountably attachable one to the other, each member being fixedly attached to the ends, respectively, of two axially juxtaposed piles, a joint member comprising a hollow cylindrical sleeve having a first end and a second end, the cylindrical sleeve at the first end thereof securely mounted at right angles to a flanged end plate, the flanged end plate having a true planar surface on the side opposite the sleeve, the flanged end plate perimeter being coextensive with the radial cross section of the piling, the sleeve being open at the second end thereof, means securely mounted within the sleeve to the end plate and extending through the open end of the sleeve, the means when mounted to a pile end being imbedded within and bonded to the internal structures within the concrete pile, a



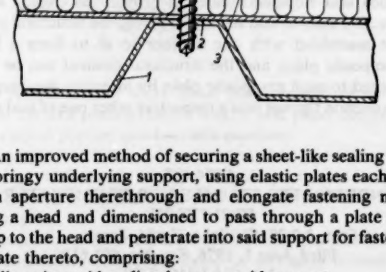
plurality of holes in the end plate positioned about the perimeter thereof in spaced relationship one to another, the sleeve having indented recesses to clear the end plate holes leaving the holes in the end plate exterior to the sleeve, fastener means sized to pass through the end plate holes, whereby when the true planar surfaces of two flanged end plates are axially aligned and juxtaposed, and the fastener means mounted through the flanged end plate holes of each member, a high strength axially aligned coupling of the concrete piles is formed.

4,074,501

METHOD OF SECURING A SEALING LAYER TO A SUPPORT

Sune Allan Sandqvist, Skalldalsvagen 34, S-430 80 Goteborg, Sweden

Filed Apr. 20, 1976, Ser. No. 678,665
Claims priority, application Sweden, Apr. 24, 1975, 75047423
Int. Cl.[2] E04B *7/00*
U.S. Cl. 52—741 **11 Claims**



1. An improved method of securing a sheet-like sealing layer to a springy underlying support, using elastic plates each having an aperture therethrough and elongate fastening means having a head and dimensioned to pass through a plate aperture up to the head and penetrate into said support for fastening the plate thereto, comprising:

(a) disposing said sealing layer on said support;

(b) applying a bonding agent on top of said sealing layer on the intended areas of securement of said plates;

(c) inserting ones of said fastening means through respective ones of said plates and pressing said plates against said sealing layer at the areas at which the bonding agent was applied for compressing the springy underlying support beneath said plates and securing said plates to the springy underlying support with said fastening means, and for

securely joining said plates to said sealing layer by means of said bonding agent; and

(d) bonding the heads of said fastening means to said plates for preventing relative movement between said plates and said heads of said fastening means.

4,074,502
METHOD FOR MANUFACTURING A SUPPORT FRAMEWORK

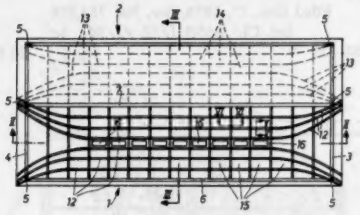
Emil Peter, Rosentalstrasse 78, Winterthur, Switzerland

Filed Oct. 18, 1976, Ser. No. 733,276

Claims priority, application Switzerland, Oct. 22, 1975, 13674/75

Int. Cl.² E04B *1/00, 7/00*

U.S. Cl. 52—741 **27 Claims**



1. A method of manufacturing a support framework containing at least one suspension element arched in one direction and serving as a roof construction, said suspension element including a plurality of tension elements and a plurality of preformed fabricated components extending between said tension elements, and with said method comprising the steps of: forming a reinforcement construction for taking up horizontal forces with said reinforcement construction including two horizontal supports extending in spaced relation from one another transversely to the intended direction of arching of the suspension element and compression type reinforcement components interconnecting said two horizontal supports, supporting the reinforcement construction upon upstanding supports, arranging tension elements of the suspension element in a substantially catenary spatial curve between the horizontal supports and anchoring such tension elements to said reinforcement construction at the region of the upstanding supports, before or after anchoring of the tension elements attaching to the tension elements concrete form elements for forming from concrete joints between fabricated components of the support framework, supporting said fabricated components between said tensioning elements on said concrete form elements, and pouring concrete joints between said fabricated components.

4,074,503
BRICK LAYING DEVICE

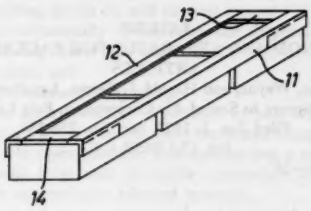
Robert Duncan Watt, and Brian William Gordon Orr, both of 96 Carisbrooke Road, Newport, Isle of Wight, England

Filed Nov. 21, 1975, Ser. No. 634,058

Int. Cl.² E04D *15/00;* **E04B** *2/00;* **E04E** *11/00*

U.S. Cl. 52—749 **9 Claims**

1. A device for use in laying bricks, which comprises a frame adapted to be placed on a previously laid course of bricks to define a trough of even depth overlying said course wherein a layer of mortar may be laid ready to receive the next brick or bricks to be laid, the frame having two longitudinally extending side members spaced apart and parallel to one another and a pair of parallel spaced apart end members connecting the ends of said side members; at least one of the longitudinal members comprising a horizontally positioned element which rests on the horizontal surface of the said course and a vertically positioned element which rigidly depends from and along the outer edge of said horizontal element and is in contact with the vertical face of said course to insure linear alignment of said course; said horizontal element extending inwardly over said course of bricks to define the whole of one edge of the trough, the inward extension being preselected to provide a required recess for pointing and said horizontal element having



a thickness chosen to provide the required depth of mortar to be applied; said spaced end members lying totally above the plane of the underside of said horizontal element when laid over a course of bricks.

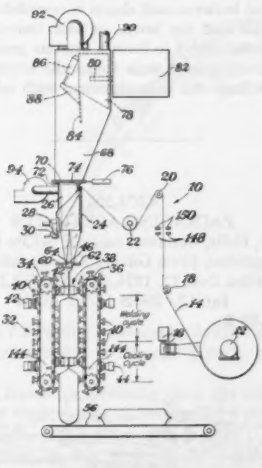
4,074,504
METHOD OF FORMING FILLING AND SEALING AN INDUSTRIAL SIZE BAG

Eddie Lee Greenawalt, and Lorenzo Dow Geren, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 572,581, April 28, 1975, which is a division of Ser. No. 460,864, April 15, 1974, Pat. No. 3,925,963, which is a continuation-in-part of Ser. No. 347,923, April 4, 1973, abandoned. This application Dec. 6, 1976, Ser. No. 747,742

Int. Cl.² B65B *9/12, 31/00*

U.S. Cl. 53—22 A **15 Claims**



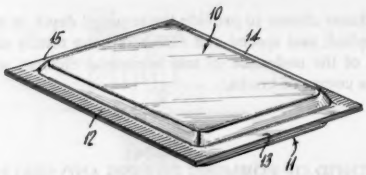
1. In the method of producing bags by forming a flexible generally vertical tube about a hollow filling mandrel, periodically clamping the tube underneath the filling mandrel and drawing the same downwardly, to provide successive product receiving spaces, and periodically dumping pre-measured product loads into the tube subsequent to each clamping step, the steps comprising: forming a narrow, channel between the inside surface of the tube and the filling mandrel to provide communication between the product receiving space and the atmosphere, and partially evacuating each successive product receiving space to make available cooperately with the channel forming step, a high velocity stream of air that is sucked downwardly between the tube and the filling mandrel to

thereby wash over the inside surface of the tube to minimize contamination of the sealing area.

4,074,505
METHOD AND APPARATUS FOR PACKAGING ARTICLES

Eitan Keren, Wayne, and Harold J. Brown, Lyndhurst, both of N.J., assignors to Sealed Air Corporation, Fair Lawn, N.J.

Filed Jan. 3, 1977, Ser. No. 756,254
Int. Cl.[2] B65B *9/02*
U.S. Cl. 53—28 **12 Claims**

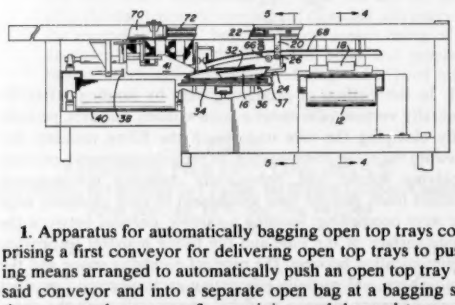


10. The method of sealing articles between sheets of material each having a cohesive coating on one side thereof comprising the steps of feeding said sheets between spaced sets of individually pivoted rollers adjusted to engage the edges of said sheet to form edge seals, forming spaced parallel upper and lower transverse seals on that portion of said sheets immediately below said rollers and simultaneously severing the sheets between the last said seals whereby an article inserted between said sheets is completely enclosed by said edge seals and the lower of said transverse seals and severed from the sheets to form a discrete package while the upper of said transverse seals forms the bottom of the next successive package still in engagement with said rollers.

4,074,506
PACKAGING APPARATUS

Bernd Sander, Halle, Germany, assignor to Cito Kunststoffe und Verpackungsfolien Erich Gilberg KG, Kunsebeck, Germany

Filed Dec. 22, 1976, Ser. No. 753,247
Int. Cl.[2] B65B *57/10, 43/34*
U.S. Cl. 53—59 R **11 Claims**

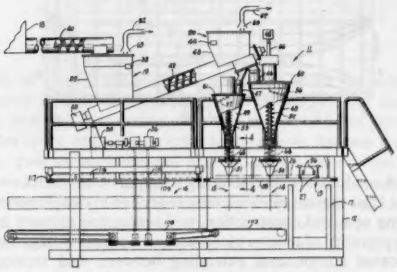


1. Apparatus for automatically bagging open top trays comprising a first conveyor for delivering open top trays to pushing means arranged to automatically push an open top tray off said conveyor and into a separate open bag at a bagging station, a second conveyor for receiving each bagged tray, said second conveyor including means for applying pressure to the top surface of the tray as the tray is moved along said second conveyor, means along side said second conveyor for sealing a bagged tray by welding the open end of the bag adjacent a side edge of the tray and for trimming scrap off the bag adjacent the weld as each bagged tray moves along said second conveyor, said pushing means including a carriage and a pusher support for reciprocation toward and away from the bagging station, means for removing scrap away from the second conveyor, and means downstream from said welding means for contacting and smoothing the weld bead in conformity to the shape of the tray.

4,074,507
BAG FILLING MACHINE FOR POWDERY MATERIAL

Walter Ruf, New City, and Harry Edward Rothmann, Valhalla, both of N.Y., assignors to St. Regis Paper Company, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,176
Int. Cl.[2] B65B *1/32, 43/34*
U.S. Cl. 53—59 W **26 Claims**



9. A bag filling machine comprising in combination,
a base,
a bag filling station on said base,
gripper means carried on said base,
actuator means to move said gripper means,
said gripper means movable by said actuator means to grip near the top of a bag,
a hopper adapted to contain a powdery material and having an outlet,
an auger in said hopper,
means to control said actuator means to raise said gripper means and any said bag to have an opening of the bag received on said outlet of said hopper,
fill control means to control the filling of a bag on said hopper outlet,
weighing means responsive to the weight on said gripper means relative to said base,
drive means to rotate said auger to move material in said hopper to said outlet, and
means responsive to a predetermined weight of said filled bag on said gripper means to actuate said fill control means to stop the filling of any said bag.

4,074,508
APPARATUS FOR COMPRESSING AND BANDING A PREDETERMINED NUMBER OF ARTICLES

Philip Lane Reid, Duncan, S.C., assignor to Riegel Textile Corporation, New York, N.Y.

Filed Dec. 21, 1976, Ser. No. 752,906
Int. Cl.[2] B65B *57/14, 13/04, 13/20, 13/32*
U.S. Cl. 53—62 **30 Claims**

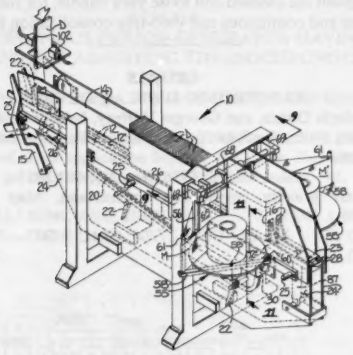
1. Apparatus for compressing and banding a predetermined number of generally flat, compressible articles, such as disposable diapers, comprising:
means positioned generally at one end of said apparatus for successively receiving the articles and for positioning the articles successively in a longitudinally extending row;

means for moving a group of a predetermined number of the articles from said receiving and positioning means in a generally longitudinal path of travel to generally the other end of said apparatus and for longitudinally compressing the group of articles at the other end of said apparatus;

means for positioning banding material across the path of travel of the group of articles and for allowing the banding material to position itself around the leading end and sides of the group of articles as the group is moved to the other end of said apparatus;

means for moving the banding material around the trailing end of the group of compressed articles positioned at the other end of said apparatus;

means for sealing the banding material together in encircling relation around the compressed group of articles; and



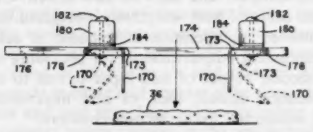
control means operatively connected to said article moving and compressing means, said band material moving means and said band material sealing means for sequentially controlling and operating these said means for the compressing and banding operation by said apparatus, said control means comprising a source of electrical energy, an electrical circuit means respectively connected between said source of electrical energy and said article moving and compressing means, said banding material moving means and said banding material sealing means for selectively supplying electrical energy therebetween for sequentially operating same, and separate manually operated switches connected in said electrical circuit means for being opened and closed for manually controlling operation of said article moving and compressing means, said banding material moving means and said banding material sealing means.

4,074,509

APPARATUS FOR FORMING, INTERLEAVING AND DISPENSING FOOD PATTIES

Bernard Miles, 119 Trenton Ave., Point Pleasant Beach, N.J. 08742

Filed May 5, 1976, Ser. No. 683,339
Int. Cl.[2] B65B *63/00, 35/54*
U.S. Cl. 53—122 **22 Claims**



1. Means for interleaving and stacking formed food patties, comprising:

a support means;

a non-magnetically attracted member supporting said support means;

means to periodically dispense individual interleaving sheets onto said support means;

means to periodically dispense formed food patties onto said interleaving sheets on said support means;

means to sequentially synchronize the dispensing of said interleaving sheets and said formed patties onto said support means; and

said support means comprising:

support arms pivotably connected to said non-magnetically attracted member movable from a raised closed to a lower open position, said arm having a portion that extends from said pivotable connection and formed from magnetically effected material;

said support arms constructed and arranged to move in pendulum-like motion upon impact of a formed food patty onto said interleaving sheets, from said raised closed position to said lower open position and then towards said raised closed position; and

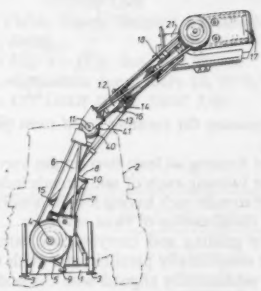
magnetic means disposed on said non-magnetically attracted member above said support arms in contact with said portion of said magnetically succeptible support arms in said closed position to thereby hold said support arms in said closed position and to assist in returning said support arms to said closed position from said open position.

4,074,510

MACHINE FOR CUTTING HEDGES, GRASS AND OTHER ARBOREAL GROWTH

William Thomas Teagle, Blackwater, Truro, England

Filed Mar. 3, 1976, Ser. No. 663,433
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—233 **16 Claims**



1. A machine for cutting or trimming hedges, grass, weeds, crops and other vegetable or arboreal growth, said machine comprising:

a supporting frame for mounting upon the rear end of an agricultural tractor, said tractor having a power take-off shaft;

a shaft journaled in said supporting frame for operative connection to said power take-off shaft;

a laterally extending boom mounted at its inner end on said supporting frame for pivotal movement about an axis parallel to the longitudinal axis of said tractor;

a work-head pivotally mounted on the outer end of said boom for movement about an axis parallel with said pivotal axis of said boom;

means operable from said tractor for independently moving said boom and said work-head about their pivotal axes;

a rotor mounted in said work-head;

a plurality of flails extending radially outwardly from said rotor;

a driving pulley mounted on said shaft;

a first driven pulley rotatably mounted on said work-head;

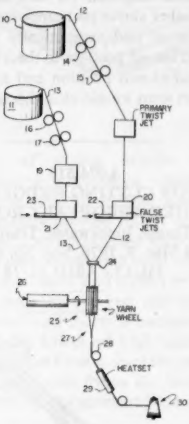
a primary belt drivingly coupling said driving pulley and said first driven pulley;
a second driving pulley rotatably mounted on said work-head and rotatable with said first driven pulley;
a second driven pulley coaxial with and mounted to said rotor; and
a secondary belt drivingly coupling said second driving pulley to said second driven pulley, whereby said primary and secondary belts serve to transmit power from said tractor to said rotor.

4,074,511

SELF TWIST YARN STRAND SYSTEM

Phillip W. Chambley, and Alan H. Norris, both of Rome, Ga., assignors to Champion International Corporation, Stamford, Conn.

Filed Dec. 30, 1976, Ser. No. 755,671
Int. Cl.[2] D01H *7/90*
U.S. Cl. 57—34 AT **13 Claims**



1. An apparatus for forming a self-twist plural strand yarn comprising
means for forming at least two singles yarn strands;
means for twisting each of said strands individually to form twisted strands each having longitudinally spaced nodes at which the direction of twist reverses;
means for guiding and carrying said strands into closely spaced substantially parallel paths with the nodes of one strand substantially aligned with the nodes of each other strand; and
means for fastening each of said strands together at said nodes and for self-twist plying of the strands between said nodes,
and wherein said means for guiding and carrying comprises a rotatable guide member,
and said means for node fastening includes rotating contact means carried by said rotatable guide member, said contact means being exposed to said yarn paths at spaced intervals for fixing said strands together at the regions of said nodes.

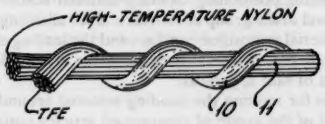
4,074,512

LOW-FRICTION FABRIC BEARING

Richard J. Matt, Simsbury, Conn., assignor to Textron, Inc., Providence, R.I.

Division of Ser. No. 160,661, July 8, 1971, Pat. No. 3,765,978. This application July 3, 1973, Ser. No. 376,235
Int. Cl.[2] D02G *3/04, 3/36;* D04C *1/06*
U.S. Cl. 57—140 BY **14 Claims**

1. A size-free low-friction fabric for void-free impregnation with a curable synthetic resin, said fabric being the washed product of construction from a yarn comprising a compounded bundle of sized TFE filaments and sized filaments of a high-temperature nylon in the proportion of at least no more than 50 percent TFE by volume and loosely twisted to an extent not



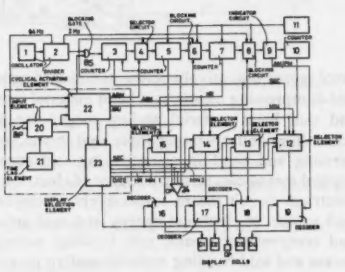
substantially exceeding three twists per inch; whereby, when said fabric is embodied in a bearing surface potted with a synthetic resin, the resin may be induced to flow into and throughout the cleaned and loose yarn bundle, for substantially intimate and continuous and void-free consolidation therewith.

4,074,513

ELECTRONIC DISPLAY DEVICE

Jean-Marie Donze, and Georges Vuffray, both of La-Chaux-de-Fonds, Switzerland, assignors to Girard-Perregaux S.A., Switzerland

Filed May 5, 1976, Ser. No. 683,282
Claims priority, application Switzerland, May 7, 1975, 5903/75
Int. Cl.[2] G04B *27/08;* G04C *3/00*
U.S. Cl. 58—4 A **10 Claims**



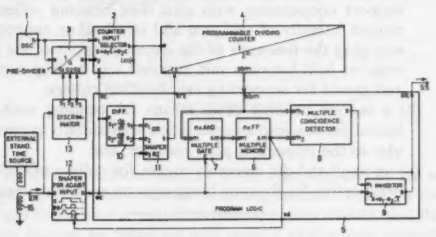
1. An electronic time piece comprising:
a plurality of display cells,
a plurality of counters for processing data to be transmitted to said cells through a coupling device,
a control circuit means for enabling modification of said data, said control circuit means comprising:
a switch,
an input circuit energized by said switch and having first and second outputs for providing activating and intervention signals respectively,
a cyclical activating circuit means having an input channel and a plurality of output channels,
an input connection between said first output of said input circuit and said input channel,
a plurality of selectively energized means coupled one each to said output channels and a plurality of intervention circuits coupled one each to said selectively energized means, each of said selectively energized means being conditioned for operation in response to actuation of a corresponding output channel for providing signals from said second output of said input circuit to a respective intervention circuit, each of said intervention circuits being connected to one of said counters,
an intervention connection coupling together said second output of said input circuit, said input channel, and said plurality of selectively energized means, said activating circuit rendered operative in response to the concurrent

presence at the input channel of an activating signal and an intervention signal, said signals issuing from said input circuit in response to at least one depression of said switch for causing the successive actuation of said output channels in a predetermined order each for a predetermined length of time, said actuation of an output channel for a said predetermined length of time conditioning for operation a respective selectively energized means for said predetermined length of time in such a manner that the issuing by said input circuit of a second intervention signal in response to a further depression of said switch during a said predetermined length of time provides said second intervention signal through said respective selectively energized means solely to that intervention circuit which is coupled to the output channel activated during said predetermined length of time.

4,074,514
ISOCHRONOUS PERIOD GENERATOR HAVING MEANS FOR ADJUSTING THE ISOCHRONOUS PERIOD

Jean M. Vaucher, Brugg, Switzerland, assignor to Dynacore, S.A., Switzerland

Continuation-in-part of Ser. No. 391,048, Aug. 24, 1973, abandoned. This application Sept. 3, 1975, Ser. No. 609,941
Claims priority, application Switzerland, Aug. 24, 1972, 12570/72
Int. Cl.[2] G04C *3/00;* **H03K** *21/32, 1/17;* **H03B** *3/04*
U.S. Cl. 58—23 AC **21 Claims**



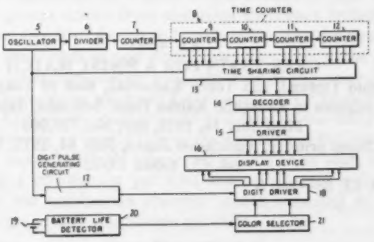
1. An electronic watch, in which a resettable isochronal period is repeated, including a time base means for supplying, for the measurement of time, a periodic signal, said time base means including a high frequency source provided with a quartz oscillator operating at its natural frequency, the period of oscillation of said oscillator defining the maximum deviation which is to be tolerated for the isochronal period when the isochronal period has been readjusted, and a frequency divider counter having an input which receives the high frequency of said source, said counter having an operating cycle constituting the isochronal period and restrictable to a memorized number "*n*" of counting steps less than the natural counting capacity of said counter; means, in the watch, for picking-up standard time information of a predetermined period from outside the watch and generating a signal corresponding to the predetermined period; conditioning means, connected to said picking-up means, for readjusting the isochronal period including means for receiving and recognizing the signal from the picking-up means to control transfer of the watch from working in an autonomous mode in which the isochronal period is produced to a readjustment mode in which the isochronal period is readjusted, said time base means further including a programmable memory means, connected to said counter and said conditioning means for memorizing the number "*n*", which memorized number acts on said counter during the autonomous mode to cause said counter to be reset, said conditioning means and said time base means including said programmable memory means causing, in the readjustment mode, a redetermination of the number "*n*" as a function of the standard time period picked-up, wherein the redetermination is constituted by said conditioning means causing zero resetting of said counter at the start of the standard time period, said high frequency source supplying the high frequency to said input of said counter without the number "*n*" acting on said counter, thereby enabling said counter to count freely within the field of its natural capacity, and said programmable memory means memorizing the state of counting of said counter at the end of the standard time period as a new readjusted, value of the number "*n*", wherein the improvement comprises:

a single detector means have a logic circuit, which merges said receiving and recognition means and said picking-up means, for receiving from the outside of the watch, through the detection of a physical action without physical contact between the physical action and the watch, a simple signal defining both the signal received and recognized by said means for receiving and recognizing to control the transfer of the watch from the autonomous mode to the readjustment mode by a given logic state which said logic circuit assumes and the standard time period by the interval of time for which this logic state lasts, said single detector means establishing the readjustment mode for the duration of the standard time period, which the interval of time for which the logic state lasts measures exactly, and wherein said detecting means establishes the autonomous mode for the entire time the standard time period is not being picked-up.

4,074,515
ELECTRONIC TIMEPIECE WITH BATTERY LIFE DISPLAY

Kazuhiro Asano, Chiba, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed July 15, 1976, Ser. No. 705,445
Claims priority, application Japan, July 15, 1975, 50-87114
Int. Cl.[2] G04B *19/34;* **G04C** *3/00*
U.S. Cl. 58—23 BA **3 Claims**



1. In a digital electronic timepiece the combination of:

alphanumerical display means comprising two sets of visual display elements disposed closely adjacent alongside one another, each set of said display elements being of a different display color from the other,

battery means for supplying power for illuminating said display means,

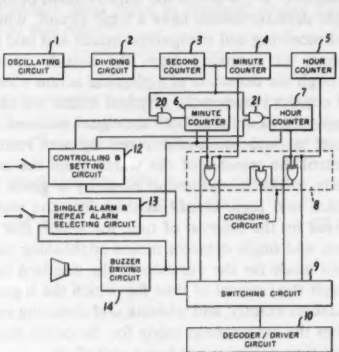
means for detecting whether the voltage of said battery means is above or below a predetermined value, and

switching means controlled by said detecting means for supplying power from said battery means to selected elements of one of said sets when the voltage of said battery means is above said value and to selected elements of the other of said sets when said voltage is below said value.

4,074,516
ALARM ELECTRONIC TIMEPIECE

Kenichi Kondo, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Oct. 13, 1976, Ser. No. 732,029
Claims priority, application Japan, Oct. 13, 1975, 50-123006
Int. Cl.[2] G04C *21/00*
U.S. Cl. 58—38 R 7 Claims

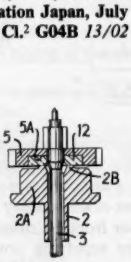


1. In an electronic timepiece of the type having a minute counter and an hour counter: settable and resettable means for storing an alarm time therein; means for detecting a coincidence between the stored alarm time and the contents of the minute and hour counters for developing a coincidence signal in response thereto; means responsive to said coincidence signal for producing an alarm; first manual means for switching between a first state and a second state; and means responsive to said coincidence signal for resetting the means for storing when the first manual means is in the first state and for maintaining the means for storing in the set condition when the first manual means is in the second state; whereby the timepiece can be selectively used in single alarm and repeat alarm modes.

4,074,517
GEAR TRAIN FOR A WRIST WATCH

Yoshio Tatsumi, and Tooru Kadowaki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed July 14, 1976, Ser. No. 705,006
Claims priority, application Japan, July 14, 1975, 50-98181
Int. Cl.[2] G04B *13/02*
U.S. Cl. 58—140 R 5 Claims

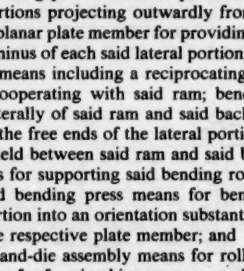


1. A gear train for a wrist watch movement comprising in combination: a center pipe, a gear wheel rotatably mounted coaxially with and at one end of said center pipe, said gear wheel being connected to a hand of the watch, and a jewel recessed in the lower face of said gear wheel and rotatably engaging said end of said center pipe, whereby the friction factor of said gear wheel in a rotary state is reduced.

4,074,518
APPARATUS FOR MAKING A LINK-TYPE CONVEYOR BELT

Klaus Taubert, Herkersdorf; Reimund Benner, and Friedrich Judt, both of Eiserfeld, all of Germany, assignors to Meyer, Roth & Pastor Maschinenfabrik GmbH, Cologne, Germany

Filed Nov. 15, 1976, Ser. No. 742,202
Claims priority, application Germany, Nov. 15, 1975, 2551453
Int. Cl.[2] B21L *11/02*
U.S. Cl. 59—15 4 Claims



1. An apparatus for making a link-type belt formed of a plurality of plate members having hinge eyes and linked together by hinge bolts passing through the aligned hinge eyes of adjoining plate members, comprising:

(a) a first bending press means for prebending free ends of lateral portions projecting outwardly from two opposite sides of a planar plate member for providing a prebent part at the terminus of each said lateral portion; said first bending press means including a reciprocating ram; a backup support cooperating with said ram; bending rollers arranged laterally of said ram and said backup support for engaging the free ends of the lateral portions of the plate member held between said ram and said backup support; and means for supporting said bending rollers;

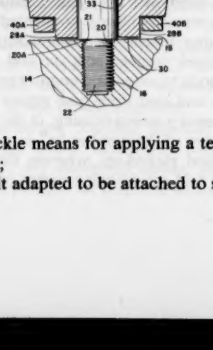
(b) a second bending press means for bending each said lateral portion into an orientation substantially perpendicular to the respective plate member; and

(c) an anvil-and-die assembly means for rolling-in each lateral portion for forming hinge eyes on each plate member.

4,074,519
SWIVEL SHACKLE

Charles Ronald Garrett, Tulsa, Okla., assignor to American Hoist & Derrick Company, Tulsa, Okla.

Filed Mar. 31, 1977, Ser. No. 783,153
Int. Cl.[2] F16G *15/08*
U.S. Cl. 59—95 8 Claims



1. A swivel shackle means for applying a tensile load to an object, comprising;

a. a shoulder bolt adapted to be attached to said object, said

bolt having a cylindrical portion of larger diameter than the attachment portion, said larger diameter portion providing a shoulder which presses against the surface of said object, to resist transverse bending moments on said bolt;

b. a load ring of unitary construction, having a body portion, including a circular bored opening, and adapted to rotate about said cylindrical portion of said shoulder bolt, and including two oppositely extending shaft portions, coaxial with each other, and perpendicular to the axis of said bore;

c. a Y-shaped pivot assembly, having bored openings on the ends of the two arms of said Y, said openings adapted to rotate about said shaft extensions of said load ring; and

d. an opening through the leg of said Y-shaped pivot assembly, adapted to receive the pin of a shackle.

4,074,520

COMBUSTION CHAMBER FOR GAS TURBINE

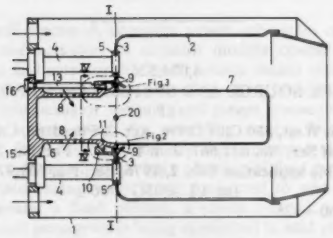
Martin Mansson, and Ragnar Torstenfelt, both of Finspong, Sweden, assignors to Stal-Laval Turbin AB, Finspong, Sweden

Filed Aug. 4, 1976, Ser. No. 711,675

Claims priority, application Sweden, Aug. 5, 1975, 7508805

Int. Cl.[2] F02C *7/20*

U.S. Cl. 60—39.32 **5 Claims**



1. In a combustion chamber of the type adapted for use with a gas turbine, said chamber including an outer mantle; a cylindrical flame tube arranged within said outer mantle, said flame tube having an upstream end wall; a center tube extending within said flame tube through a central opening in said end wall, said central opening being sized to permit movement of said end wall relative to said center tube and said center tube being provided with openings to pass air into the center of said flame tube; and a plurality of burnes arranged around said center tube and extending into said flame tube through a corresponding plurality of openings in said end wall, each of said plurality of openings being sized to permit movement of said end wall relative to said burners, the improvement comprising: the placement of said central opening and said plurality of openings in said end wall of said flame tube for said center tube and said burners in a common plane, whereby a certain angular deviation between the longitudinal axis of said flame tube and said center tube is permitted.

4,074,521

FUEL CONTROL SYSTEM FOR A GAS TURBINE ENGINE

Trevor Stanley Smith, Sutton Coldfield, England, assignor to Lucas Industries Limited, Birmingham, England

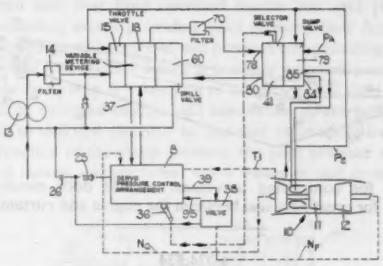
Filed Sept. 8, 1976, Ser. No. 721,234

Claims priority, application United Kingdom, Sept. 16, 1975, 37971/75

Int. Cl.[2] F02C *9/08*

U.S. Cl. 60—39.28 R **8 Claims**

1. A fuel control system for a gas turbine engine, comprising a variable metering device through which fuel flows, in use, to the engine, a throttle valve in series with said metering device, said throttle valve including means responsive to an increase in the pressure at an outlet of the engine compressor for reducing fuel flow through the throttle valve, means, responsive to a first servo pressure derived from the pressure difference across said throttle valve, for controlling said variable metering device, and means responsive to a difference between desired and actual engine speeds for varying said first servo pressure.



4,074,522

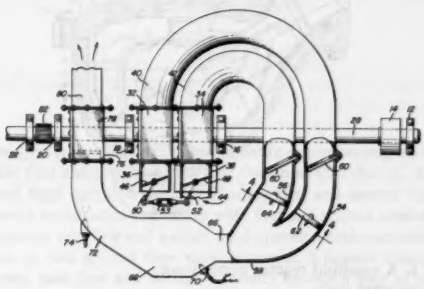
ROTARY ENGINE

Jimmy J. McDowell, P.O. Box 11456, Tucson, Ariz. 85706

Filed Sept. 7, 1976, Ser. No. 721,321

Int. Cl.[2] F02C *5/02*

U.S. Cl. 60—39.61 **10 Claims**



1. In combination, a main rotary shaft, first and second rotary pumps driven from said main shaft each including an inlet and an outlet, mixing and combustion chamber means into which the outlets of said pumps open, the inlet of one of said pumps comprising an air inlet, the inlet of the other of said pumps comprising an air and fuel mixture inlet, charge forming means operatively connected to said inlet of the other pump for providing an overly rich mixture of air and fuel thereto, a rotary motor drivingly connected to said main shaft and including a combustion gas inlet and an exhaust outlet, said mixing and combustion chamber means including an outlet connected to said combustion gas inlet.

4,074,523

PRESSURE ACTUATED COLLAPSIBLE CURTAIN LINERS FOR A GAS TURBINE ENGINE NOZZLE

Richard P. Holler, Palm Beach Gardens, and Connie W. McMath, North Palm Beach, both of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

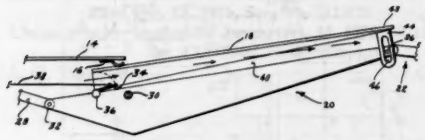
Filed Dec. 8, 1976, Ser. No. 748,581

Int. Cl.[2] F02K *1/12, 11/02;* **F02C** *7/18*

U.S. Cl. 60—266 **2 Claims**

1. A cooling control system for convergent-divergent turbo jet engine exhaust nozzles comprising: in a convergent exhaust nozzle section, a movable curtain liner means hingedly attached to the exhaust nozzle section and forming a duct for cooling airflow when in a first position; means connected to said curtain liner for limiting movement thereof, door means

positioned at one end of said curtain liner and mounted on the exhaust nozzle section and in hinged relationship therewith;



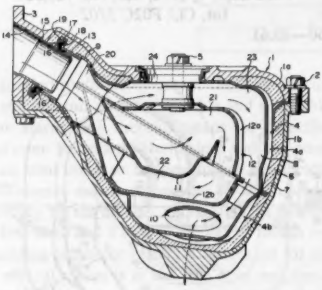
means for controlling movement of said door means, and means for creating a seal between the engine and curtain liner.

4,074,524

MANIFOLD REACTOR

Taro Ikeya, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed May 4, 1976, Ser. No. 683,226
Claims priority, application Japan, Feb. 18, 1976, 51-16856
Int. Cl.[2] F01N *3/10*
U.S. Cl. 60—282 **2 Claims**



1. A manifold reactor comprising:
an inner core;
an outer core which encloses said inner core therein;
said outer core having an inlet tube mounted therein;
said inner core having a tubular portion for introducing exhaust gases therein;
said tubular portion having a flanged inlet end;
said inlet tube being telescopically received by said tubular portion;
an annular elastic seal element made of a stack of a plurality of annular heat resistant elastic metal sheets and having an L-shaped cross section defined by a flange portion and a tubular portion;
said flange portion of said annular seal element being connected to said flanged inlet end of said inner core tubular portion in a manner such that a relative axial movement between said annular seal element and said inner core tubular portion is prevented while said tubular portion of said annular seal element is received between said inner core tubular portion and said inlet tube; and
said annular seal element being slidably engaged on a peripheral surface of said inlet tube.

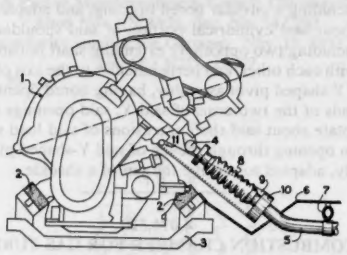
4,074,525

EXHAUST DEVICE FOR A COMBUSTION ENGINE

Robert Le Salver, Chanteloup Les Vignes, France, assignor to Automobiles Peugeot, Paris, France

Filed June 22, 1976, Ser. No. 698,505
Claims priority, application France, July 4, 1975, 75 21175
Int. Cl.[2] F01N *7/08*
U.S. Cl. 60—322 **5 Claims**

1. A gas exhaust device for and in combination with a combustion engine and a structure on which structure the engine is elastically mounted, said device comprising an exhaust manifold carried by the engine, an exhaust pipe which includes a flexible section and is connected to the manifold, the flexible section being disposed adjacent an upstream end of the exhaust



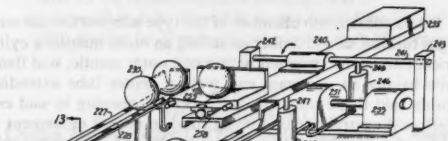
pipe relative to the flow of exhaust gases through the pipe, a support independent of said structure, a part of the exhaust pipe located immediately downstream of the flexible section relative to said flow being connected to the support, and a flexible connection connecting the support to the engine.

4,074,526

PRESSURE SOURCE AND SYSTEMS INCORPORATING IT

William S. West, 380 Cliff Drive, Apt. 2, Pasadena, Calif. 91107

Division of Ser. No. 432,667, Jan. 17, 1974, Pat. No. 3,961,480.
This application Feb. 2, 1976, Ser. No. 659,979
Int. Cl.[2] F03G *3/00*
U.S. Cl. 60—325 **19 Claims**



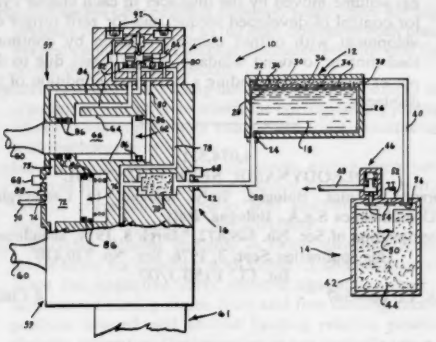
1. A pressure source comprising: pressurizing means comprising an enclosure which bounds a chamber, said enclosure comprising a first and a second portion, at least one of which is movable relative to the other as a consequence of a force applied to one of them so as to reduce the volume of the chamber and thereby to place under pressure liquid which is contained therein; a conduit leading from said chamber through which a stream of said liquid under pressure can flow for use in doing work; discrete weight means; buoyant lift means for elevating said weight means as the consequence of a rise in a water level on which the lift means floats; force transmission means so disposed and arranged as to apply force from an elevated weight means to one of said portions for reducing the volume of said chamber as a consequence of the descent in elevation of said weight means; whereby to produce said stream under pressure; and means for transferring said elevated weight means from said lift means to said force transmission means.

4,074,527

SELF-CONTAINED POWER SUBSYSTEM

James E. Sadler, Huntington Beach, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 9, 1976, Ser. No. 675,678
Int. Cl.[2] F15B *15/18*
U.S. Cl. 60—325 4 Claims



1. A self-contained, complete power subsystem comprising at least one actuator, an actuator module operatively connected to said actuator, hydraulic source means connected to said actuator module for providing an operative hydraulic fluid to said actuator module, and means connected to said hydraulic source means for providing motive force to said hydraulic fluid, said actuator module comprising at least one manifold, said manifold having a plurality of fluid passageways therein, said passageways being connected to said hydraulic source means, a fluid plenum, a piston located within said plenum, said passageways being connected to said plenum and said plenum being connected by a rupturable seal to the atmosphere in order to release to the atmosphere said hydraulic fluid which has been used within said subsystem, and a servo-valve, said servo-valve being connected to said passageways, weaus for actuating to direct said servo-valve said hydraulic fluid within said passageway in a preselected manner thereby causing the operation of said actuator, whereby upon actuation of said means for providing motive force to said hydraulic fluid, said hydraulic fluid is directed to said actuator module thereby providing controlled operation of said actuator for the predetermined period of time in which hydraulic fluid is available prior to release of said operative hydraulic fluid to the atmosphere.

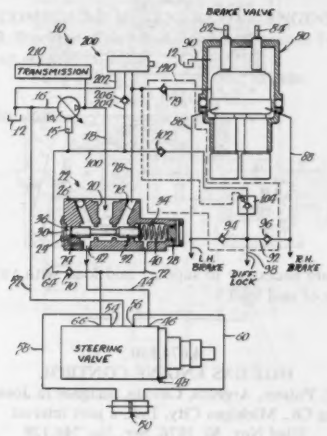
4,074,528

HYDRAULIC CONTROL SYSTEM WITH PRIORITY FLOW CONTROL

Patrick M. Lourigan, Kenosha, and Ramkishan Khatti, Racine, both of Wis., assignors to J. I. Case Company, Racine, Wis.

Filed Aug. 2, 1976, Ser. No. 710,802
Int. Cl.[2] F15B *11/20*
U.S. Cl. 60—422 5 Claims

1. A hydraulic control system including a reservoir, a pump having pressure compensating means associated therewith, first and second flow control means controlling flow to first and second fluid operated devices and a priority flow control valve between said flow control means and said pump, said priority flow control valve including a housing having a valve bore therein with a valve spool slidable in said valve bore and cooperating therewith to define first and second chambers on opposite ends of said spool, biasing means in said first chamber biasing said spool to a first position, said housing having an inlet port connected to said pump and communicating with said bore and first and second outlet ports respectively connected to said first and second flow control means, said first outlet port being in communication with said inlet port when said valve spool is in said first position while said valve spool blocks flow to said second outlet port, means connecting said first outlet port to said second chamber, connection means between said first fluid operated device and said pressure compensating means providing pilot pressure flow from said first fluid operated device to said pressure compensating means when said first control means is in either actuated position to operate said pump as a function of the pressure of fluid in said first fluid operated device, said connection means being connected to said first chamber so that said valve spool is moved as a function of the pump pressure, the pilot pressure and the biasing means, unidirectional valve means in said connection



means preventing flow from said pressure compensating means to said first chamber and said first fluid operated device, said second fluid operated device including first and second fluid operated brake actuating means with first and second conduits connecting said first and second fluid operated brake actuating means to said second flow control means, a branch conduit between said first and second conduits having a pair of opposed unidirectional valves therein preventing flow between said first and second conduits and unidirectional valve means connected to said branch conduit between said opposed unidirectional valves and to said pressure compensating means for preventing flow from said pressure compensating means to said first and second fluid operated brake actuating means.

4,074,529

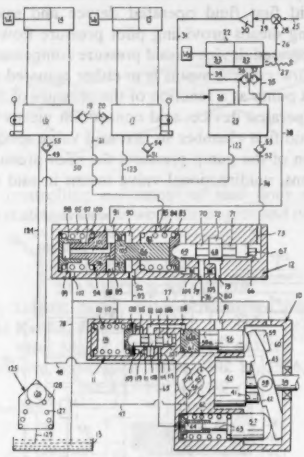
LOAD RESPONSIVE SYSTEM PUMP CONTROLS

Tadeusz Budzich, 80 Murwood Drive, Moreland Hills, Ohio 44022

Filed Jan. 4, 1977, Ser. No. 756,618
Int. Cl.[2] F16H *39/46;* F15B *11/16*
U.S. Cl. 60—445 36 Claims

1. A fluid power and control system comprising a fluid pump, a fluid motor driving a load, and valve means interposed between said pump and said motor to control said load, flow changing means operable to vary fluid flow delivered from said pump to said fluid system to vary pressure in said fluid system, first control means having means operable to limit through said flow changing means maximum pressure of said system to a fixed predetermined level, second control means having means operable to limit through said flow changing means minimum pressure of said system to a fixed predetermined level, control signal generating means to generate a control signal proportional to magnitude of said load, and third control means responsive to said control signal having means operable through said flow changing means to maintain a preselectable relatively constant ratio between pressure of said

fluid system and pressure necessary to support said load and to vary pressure differential between pressure of said fluid system



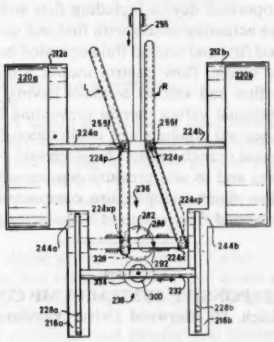
and pressure necessary to support said load with variation in magnitude of said load.

4,074,530

HOT GAS ENGINE CONTROL

Norman E. Polster, Argenta, Canada, assignor to Josam Manufacturing Co., Michigan City, Ind., a part interest

Filed Nov. 30, 1976, Ser. No. 746,128
Int. Cl.[2] F02G *1/06*
U.S. Cl. 60—518 **10 Claims**



1. A hot gas engine comprising:

a housing supporting a rotary output element;

a displacer cylinder space associated with the housing and having one end serving as a hot chamber end;

a work cylinder space associated with said housing and communicating with the other end of, and with the displacer cylinder space defining a space receiving a gas as the engine fluid working medium;

a displacer mounted to reciprocate in the displacer cylinder space and having a displacer connector shaft projecting from the displacer cylinder space and slidably mounted relative to said housing;

a piston slidably mounted in the work cylinder space and having a piston connecting rod projecting from the work cylinder space and slidably mounted relative to said housing;

motion converting means connecting the piston rod and the output element for motion conversion between reciprocation of the piston and rotation of the output element;

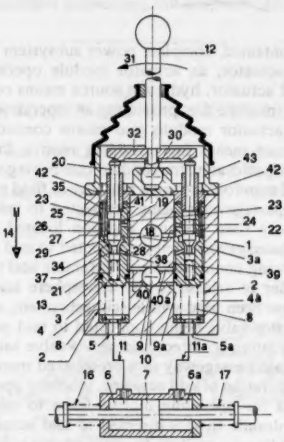
interconnecting means interconnecting the piston with the displacer for reciprocating the displacer at the same rate as and with a predetermined phase relation to the piston reciprocation; the last said means including control means for varying the displacer stroke length for a maximum stroke length to a zero stroke length thereby varying the gas volume moved by the displacer in each engine cycle for control of developed torque, and for zero torque development with output element rotation by continued load motion to avoid windage energy losses due to displacer motion by providing a stationary condition of the displacer.

4,074,531

OLEODYNAMIC SERVO CONTROL

Corrado Menini, Bologna, Italy, assignor to Lamborghini Oleodinamica S.p.A., Bologna, Italy

Continuation of Ser. No. 449,472, March 8, 1974, abandoned.
This application Sept. 3, 1976, Ser. No. 720,428
Int. Cl.[2] F15B *3/00*
U.S. Cl. 60—547 **4 Claims**



1. A servo-control system for the positioning of a load, comprising:

a load-driving piston reciprocable in a piston cylinder and provided with spring means tending to hold said piston in a neutral intermediate position within said chamber, said piston having a head dividing said piston cylinder into two compartments;

a servomechanism including two symmetrical pressure cylinders, a pair of plungers in said pressure cylinders defining therein two pressure chambers of variable volume, each plunger being provided with an axial bore forming a valve chamber which communicates via an internal passage in said plunger with a variable space adjacent a face of the respective plunger remote from the corresponding pressure chamber, each plunger having a solid face confronting its respective pressure chamber, each pressure chamber being provided with a discharge port communicating with a respective compartment of said piston cylinder;

a pair of valve members in said plungers having stems traversing the axial bores thereof and projecting therefrom at ends remote from said pressure chambers, each valve chamber being provided with an inlet orifice and with an outlet orifice axially separated from each other by the corresponding valve member, said internal passage terminating at a location of said valve chamber between said

orifices, each valve member being axially shiftable with respect to the corresponding plunger between first and second limiting relative positions in which said internal passage is disconnected from said inlet orifice and from said outlet orifice, respectively, restricted flow paths existing between said internal passage and said orifices in intermediate relative positions of the corresponding valve members;

conduit means connecting a common supply port for high-pressure hydraulic fluid to the inlet orifices of both plungers and connecting a common discharge port for said fluid to the outlet orifices thereof;

relatively strong first biasing means urging each plunger into a withdrawn position in which the corresponding pressure chamber has its maximum volume and communicates with said discharge port;

relatively weak second biasing means urging each valve member into its first limiting relative position for cutting off the corresponding outlet port and internal passage from the corresponding inlet port; and

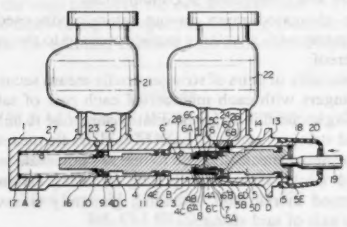
an operating element movable in either direction from a midposition for coacting with either of said stems to displace the respective valve member against the force of said second biasing means from said first limiting relative position toward said second limiting relative position, thereby generating fluid pressure in said variable space to advance the corresponding plunger from said withdrawn position against the force of said first biasing means and closing said discharge post while reducing the volume of the associated pressure chamber with resulting buildup of fluid pressure in one of said compartments to displace said piston in a respective direction against the force of said spring means until the fluid pressure in said variable space balances the combined force of said first biasing means and said spring means, hydraulic fluid present in the other of said compartments being concurrently discharged via the pressure chamber associated with the other plunger and being replenished at low pressure from said discharge port upon subsequent reversal of the piston motion.

4,074,532

HYDRAULIC MASTER CYLINDER

Yoshihiro Hayashida, Chigasaki, and Tetsuo Haraikawa, Funabashi, both of Japan, assignors to Tokico Ltd., Japan

Filed Feb. 17, 1976, Ser. No. 658,662
Claims priority, application Japan, Feb. 18, 1975, 50-20109
Int. Cl.[2] B60T *11/20*
U.S. Cl. 60—562 **4 Claims**



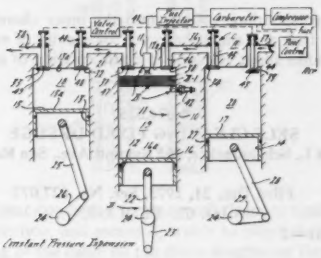
1. A master cylinder construction comprising a cylinder having two piston chambers of different diameters, a first piston and a second piston slidably disposed respectively in said piston chambers, reduced diameter stems projecting from the opposing end portions of the pistons, respectively, a flange formed around the outer periphery of each of the stems, one of said stems having a substantially spherical end surface abutting the opposed end of the other of said stems, a split sleeve consisting of at least two cooperating elements and having inwardly projecting portions on the inner circumferential surface thereof at the opposite ends respectively, said split sleeve being around said reduced diameter stems with the inwardly projecting portions engaging behind the respective flanges, and a sleeve member around the outer circumference of the split sleeve portions for retaining the split sleeve portions in the cylindrical shape, one of said pistons having an axially extending portion adjacent said reduced diameter stem, the diameter of said extending portion being complementary and smaller or equal to the inner diameter of the sleeve member, whereby when coupling the pistons, the sleeve member is positioned on the extending portion beforehand and thereafter is moved axially to surround the split sleeve portions.

4,074,533

COMPOUND REGENERATIVE ENGINE

Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed July 9, 1976, Ser. No. 703,884
Int. Cl.[2] F02G *1/02*
U.S. Cl. 60—620 **6 Claims**



1. A hot gas Ericsson-Stirling cycle engine, comprising:

(a) first means defining a relatively hot and a relatively cool gas chamber for confining a working fluid, said working fluid containing a combustible constituent,

(b) Second means associated with said chambers for shifting a major part of the working fluid between said chambers while extracting work from the thermal energy content thereof, said second means providing for two constant volume processes in the Ericsson-Stirling cycle and being effective to intermittently release thermal energy directly thereinto as a result of combustion of a portion of said working fluid, said second means having a catalytic combustor and regenerator located in said hot chamber facilitating said combustion of a portion of said working fluid, said catalytic working fluid passing reversibly therethrough, and

(c) third means coupled to said chambers for substituting new working fluid for existing or combusted working fluid.

4,074,534

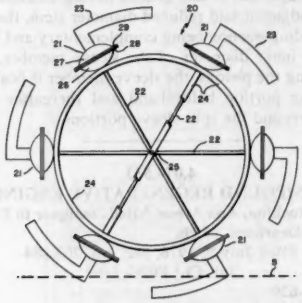
THERMODYNAMIC MOTOR

Wesley W. Morgan, 208 Dandelion, San Antonio, Tex. 78213

Filed Feb. 3, 1977, Ser. No. 765,269
Int. Cl.[2] F01K *7/00*
U.S. Cl. 60—675 **9 Claims**

1. A thermodynamic motor adapted to be at least partially immersed in a heated liquid comprising a frame, an axle mounted for rotation of said frame, a plurality of diagonally disposed pairs of tanks mounted in spaced relationship on said frame, a flexible diaphragm in each tank forming inner and outer chambers, a conduit interconnecting the inner chambers of each pair of tanks, at least one radiator communicating with the outer chamber of each tank, a volatile liquid substantially filling at least said radiator of each tank, and a fluid carried in said inner chambers of each pair of tanks whereby the radiator of the lower tank of each pair at the bottom of its travel is at least partially immersed in said heated liquid and upon volati-

zation of said volatile liquid the vapor pressure distends said diaphragm, forces the fluid from the inner chamber of said tank



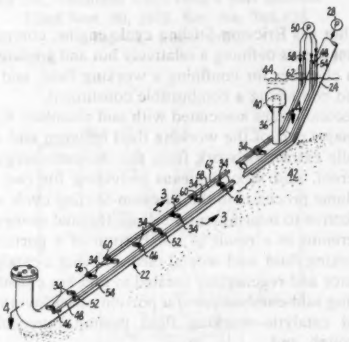
and a corresponding volume into the inner chamber of the opposing tank and shifts the center of gravity of each of said pairs of tanks about said axle to cause rotation of said motor.

4,074,535

SELF-CLEANING FIXED DREDGE

Townsend L. Schoonmaker, 265 Summit Ave., San Rafael, Calif. 94901

Filed Dec. 21, 1973, Ser. No. 427,077
Int. Cl.[2] E02B *3/02*
U.S. Cl. 61—2 **2 Claims**



1. An apparatus for removing sediment submerged in water which comprises a stationary conduit submerged under a body of water near the bottom thereof and having lateral passageway means opening into the conduit and distributed along its length with the apparatus arranged to provide fluid streams entering the conduit through the lateral passageway means to carry water and sediment into the conduit, the improvement for tendering the apparatus self-cleaning which comprises a plurality of nozzles mounted in fixed position adjacent to the conduit directed transversely across the fluid streams entering the lateral passageway means, and a source of high pressure fluid connected to the nozzles for directing fluid jets from the nozzles across the fluid stream to remove and abrade objects blocking the stream, the lateral passageway means including a plurality of orifices opening into the stationary conduit which are spaced along its length and further including means for separately connecting the nozzles in selected groups to the source of pressurized fluid, each nozzle being oriented to direct a jet of pressurized fluid laterally across the exterior opening of a separate orifice, but spaced from the separate orifice so as not to impinge upon it, wherein the nozzles are divided into at least two groups on opposite sides of the conduit surface, the nozzles within each group being spaced at predetermined distances along the length of the conduit in alternation with the nozzles of the other groups, and wherein the means for connecting the nozzles to the source of high pressure fluid includes a plurality of pipes, each group being connected to the source of high pressure fluid by a separate pipe.

4,074,536

OIL WELL CONSOLIDATION TREATING

Bill M. Young, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Aug. 2, 1976, Ser. No. 710,751
Int. Cl.[2] E02D *3/14*
U.S. Cl. 61—36 C **7 Claims**

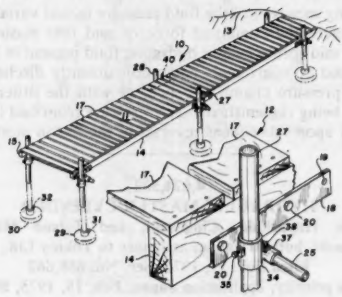
1. A process for increasing the stability and resistance to degradation by aqueous media of a consolidated permeable mass where the permeable mass contains exposed siliceous surfaces comprising, contacting said permeable mass with a treating fluid containing at least one organosilicon compound having a hydrophobic group and a silica bonding group, and maintaining said treating fluid in contact with said permeable mass under conditions which cause said organosilicon compound to form a hydrophobic film on said siliceous surfaces and increases resistance to degradation by water.

4,074,537

DOCK BRACKET

John Peter Gronlie, 4248 - 41st Ave. South, Minneapolis, Minn. 55406

Filed May 18, 1977, Ser. No. 798,137
Int. Cl.[2] F02B *3/20*
U.S. Cl. 61—48 **5 Claims**



1. Shoreline dock means for providing an elevated support and walking ramp over the surface of a body of water adjacent the shore and comprising in combination:

a. an elongated ramp having laterally disposed support stringers with a walking surface secured to the upper edge thereof;

b. a plurality of pairs of stringer cradle means secured to said stringers with each member of each pair of said cradles being secured in opposed relationship, one to another, and said stringers and with each of said cradle means having a first sleeve means secured to one of said cradle means with said sleeve means comprising a casing having a bore formed therein and extending generally transversely to the axis of said stringer;

c. post means arranged to be positioned laterally adjacent each of said cradle means for supporting said ramp and having pad means secured to the base thereof and with a second sleeve means arranged to be vertically adjustably attached thereto, with said second sleeve means comprising a casing having a bore formed therein to be slideably retained on said post means and locking means for lockably retaining said second sleeve means on said post;

d. third sleeve means secured to said second sleeve means and comprising a casing having a bore formed therein and with said bore extending generally at right angles to the bore in said second sleeve means;

e. cross-member support means arranged to be slideably

received within said first and third sleeve means and extending transversely of said lateral stringers and through opposed pairs of said first sleeve means and arranged to be lockably received within opposed pairs of said first sleeve means; and

f. locking means coupled to said first sleeve means for adjustably securing said cross-member support means thereto.

4,074,538

WALL STRUCTURES

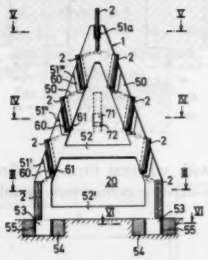
Jürgen Peter Janus, Neuer Markt 17, 5657 Haan, Rhineland, Germany

Filed Feb. 25, 1976, Ser. No. 661,337

Claims priority, application Germany, Mar. 26, 1975, 2513268; July 21, 1975, 2532520

Int. Cl.[2] E02D *17/00*

U.S. Cl. 61—47 **11 Claims**



1. An acoustic barrier wall comprising:

at least two concrete support structures spaced apart in a longitudinal direction and each having an apex and two beams standing on the ground and extending outwardly and downwardly from said apex to form an inverted V;

a plurality of support brackets integral with and spaced vertically along each of said beams and spaced horizontally in a direction transverse to said longitudinal direction;

a rectangular concrete elongated wall panel extending longitudinally between each of said support brackets on one of said structures and the corresponding support bracket on the other structure, said panels each being oriented generally vertically and defining an interior space substantially closed in the transverse horizontal direction and open in the upward direction, said brackets being so oriented that said wall panels each tip outwardly at their upper edges from the wall panels of the other beams; and

a mass of earth filling said space and having an upper surface suitable for planting exposed between said wall panels.

4,074,539

EXPANSIBLE MANDREL WITH AN EXTERNAL, CABLE ACTUATING WINCH

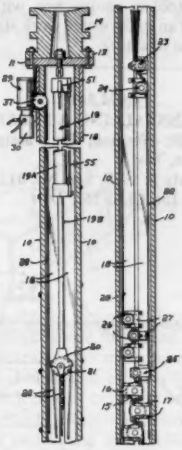
Charles L. Guild, 7 Stone Tower Lane, Barrington, R.I. 02806, and Goodman B. Willard, P.O. Box 62, Newport, Oreg. 97365

Filed Sept. 23, 1976, Ser. No. 725,952

Int. Cl.[2] E02D *7/30*

U.S. Cl. 61—53.72 **12 Claims**

1. An expansible mandrel for use in driving or withdrawing tubular piles and the like, said mandrel comprising sections, a head connected to and joining the upper ends of the sections, said sections being shaped and dimensioned so that they may move towards and away from each other to have a first, pile-entering relationship and a second, pile-gripping relationship, at least one cable within and extending lengthwise of the mandrel with one end connected thereto, first and second series of sheaves within the mandrel, one series for each section and spaced lengthwise thereof, means connecting said sheaves to their respective sections, the cable in such trained engagement with first and second series sheaves that the cable is held sinuous thereby in one of said relationships, the sheave connecting means providing that a straightening pull on the cable exerts force in opposite directions on the two sheave series to force the sections relative to each other into the other of their relationships, said mandrel having an opening in its upper end adjacent said head, and a power operated unit including a



winch, a motor connected to the winch drum to rotate it in a winding direction, and means operable to effect the progressive winding of the cable on the drum lengthwise thereof, the other end of said cable connected to said drum, means connecting said unit to the outside of said mandrel with the drum positioned relative to the opening to enable said cable to be secured thereto and wound or unwound therefrom.

4,074,540

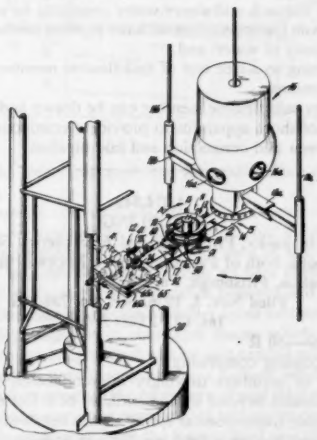
TOOL SYSTEM FOR SUBMERGIBLE CHAMBER

Burton Hoster Mason, P.O. Box 504, Covington, La. 70433, and Marvin Feldman, 788 Columbus Ave., New York, N.Y. 10025

Filed Mar. 10, 1976, Ser. No. 665,628

Int. Cl.[2] B63C *11/40*

U.S. Cl. 61—69 R **20 Claims**



1. A tool system for a submergible chamber comprising tool drive means mounted at the outward end of a work arm for the chamber, said tool drive means comprising means to connect a

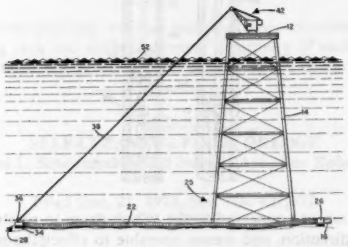
tool therewith, means to mount a plurality of tools so as to be disposed between the tool drive means and the chamber, so that at least one of said tools is in alignment with said connection means, and means associated with said work arm to provide movement between said tool drive means and said one tool, so that the tool connects with the tool drive means, whereby the connection of the tool to the tool drive means provides use of the tool in conjunction with the submerged chamber operation at an underwater work station, without the need for surfacing the chamber.

4,074,541

METHOD OF INSTALLING A FLEXIBLE RISER

Joe Cooper Lochridge, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Filed July 5, 1977, Ser. No. 812,822
Int. Cl.[2] F16L *1/04*
U.S. Cl. 61—110 **8 Claims**



1. A method of providing a continuous fluid flow path from a relatively rigid pipeline laying along the bottom of a body of water to an above water surface connection on an offshore apparatus comprising the steps of

laying said pipeline along the bottom of said body of water toward said offshore apparatus from a pipelaying vessel,

terminating said pipeline at a point sufficient to reach approximately to said offshore apparatus at its supporting base,

connecting to said pipeline at said terminated end, a flexible tubular pipeline member having sufficient strength to withstand the normal operating flow path conditions,

continuing to lay said flexible member and the pipeline,

terminating said flexible member at a length at least sufficient to reach said above water connectin on said apparatus from the connection with the pipeline on the bottom of the body of water, and

connecting to a free end of said flexible member a connection means,

whereby said flexible member can be drawn and secured to said offshore apparatus to provide a continous flow path between said connection and said pipeline.

4,074,542

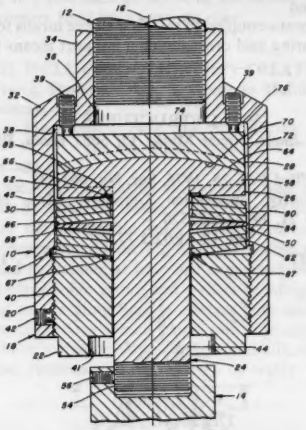
COUPLING

Andrew Hankosky, Pittsburgh, and E. Frederick Schoeneweis, Coraopolis, both of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 3, 1976, Ser. No. 738,366
Int. Cl.[2] F16D *3/06*
U.S. Cl. 64—30 R **7 Claims**

1. A coupling comprising:

a pair of members drivingly interconnected for relative movement beyond spaced surfaces of a lost motion connection; frusto-conical spring means between said spaced surfaces having a first annular rim engaging one of the spaced surfaces and second annular rim engaging a frusto-conical spacer means operatively connected to the other of said spaced surfaces, the conical angle of the spring means being less than the conical angle of the spacer means such that the spring means increasingly deflects toward the opposed surface of the spacer means upon relative movement therebetween until complete engagement therewith whereat further deflection is prevented and a direct driving connection established between the members.

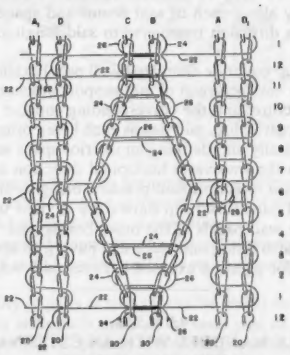


4,074,543

LACE AND A METHOD FOR ITS MANUFACTURE

Frederick O. G. Schmidt, Mohnton, Pa., assignor to Allura Corporation, Reading, Pa.

Filed Oct. 26, 1976, Ser. No. 735,466
Int. Cl.[2] D04B *21/00*
U.S. Cl. 66—193 **3 Claims**



1. A net material knit on a raschel knitting machine characterized in appearance by a repetitive pattern of squares that circumscribe small six-sided figures, the net being defined by a primary and a secondary group of threads,

each thread of the primary group being continuously chain-stitched to provide a plurality of adjacent, independent knitted wales,

each thread of the secondary group being unlooped with respect to itself but laid into the loops of the wales of the primary group in a selected manner that fixedly positions the wales with respect to each other and establishes the pattern of the lace,

a first thread of the secondary group passing through the loops of an adjacent pair of wales to form the side edges of adjacent pattern repeats and link them together,

the first thread of the secondary group also being caused to

interconnect in the weft direction the opposite sides of a given repeat unit to complete the square pattern in the weft direction,

a second adjacent pair of knitted wales partially displaced and held in the weft direction within the interior of the defined square of the netting by a second and third thread of the secondary group of threads,

the second and third threads of the secondary group joining the wales of the second pair to each other adjacent the top and bottom of the repeat pattern intermediate the side edges and joining each wale of the second pair to the adjacent wale of the first pair at a midpoint in the side wall of the square in the warp direction.

4,074,544

HEATING DEVICES FOR THE HEAT TREATMENT OF TEXTILE FILAMENTS OR YARNS

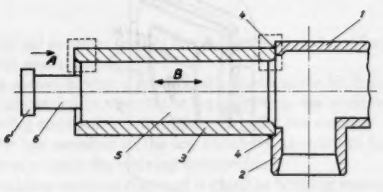
Walter Lüthi, Ebnat-Kappel, Switzerland, assignor to Heberlein Maschinenfabrik AG, Switzerland

Filed Jan. 31, 1977, Ser. No. 764,240

Claims priority, application Switzerland, Feb. 12, 1976, 1704/76; Apr. 26, 1976, 5196/76

Int. Cl.[2] D06B *23/18*

U.S. Cl. 68—5 E **7 Claims**



1. A heating device for the heat treatment of textile filaments and yarns comprising a container including first and second openings at opposite ends thereof, respectively for entry and exit of yarn passing through said container, said container being further formed with a port for the admission into said container of a fluid heating medium at superatmospheric pressure, first and second tubular extensions respectively sealingly connected to said opposite ends of said container so that each of the openings at each end of said container opens within the end of the tubular extension at that end, first and second plungers formed so as to provide a close sliding fit in respective ones of said first and second tubular extensions, each said plunger including a longitudinal surface having a groove arrangement therein of U-shaped cross-section and extending along at least a substantial portion of said plunger, the depth and width of the U-shaped cross-section being at least approximately equal and having a value of at least 0.1 mm, said groove arrangement being positioned for the passage of yarn from outside one of said tubular extensions along the groove arrangement in the plunger in that tubular extension, then through said container into the other said tubular extension and through the groove arrangement in the plunger in said last mentioned tubular extension to the outside thereof, said plungers substantially completely preventing the escape of heating medium from said container through said tubular extensions while yarn travels through said container and along said groove arrangement.

4,074,545

BIMETAL LID LOCK

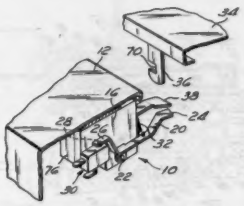
Richard P. Case, Webster City, Iowa, assignor to Franklin Manufacturing Company, St. Cloud, Minn.

Filed Aug. 26, 1976, Ser. No. 718,056

Int. Cl.[2] D06F *37/42*

U.S. Cl. 68—12 R **2 Claims**

1. A safety interlock for a door of an appliance or the like having motor driven means therein, comprising a door movable between open and closed positions, a motor driving said driven means, a frame member, a latch mechanism mounted on said frame member, said latch mechanism including switch means having a switch arm pivotally connected to said frame member for movement along a path of travel in a first plane, said switch arm having first and second ends, a switch mounted on said frame and being in the path of travel of said switch arm, a bimetallic element having first and second ends, said bimetallic element being fixed at said first end to said frame member and carrying latch finger means at said second end, said bimetallic element, upon the application of heat



thereto, being movable to move said latch finger in a second plane angularly related to said first plane, said switch closing a portion of an electrical circuit upon movement of said switch arm, said motor and bimetallic element being in said circuit, a timer control switch in said circuit operable to complete the remainder of the circuit, projection means carried by said door and engaging said switch arm upon closure of said door, said projection means having a notch therein positioned in said second plane when the door is closed and engageable by said latch finger upon application of heat to said bimetallic element when said circuit is completed.

4,074,546

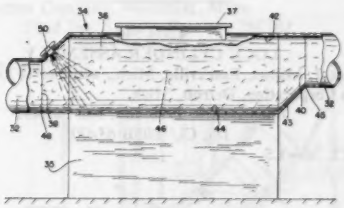
FLUID TREATING SYSTEM FOR TEXTILE FIBERS

James H. Roberson, Greenville, S.C., assignor to Crompton & Knowles Corporation, New York, N.Y.

Filed Nov. 24, 1976, Ser. No. 744,673

Int. Cl.[2] D06B *1/02*

U.S. Cl. 68—205 R **14 Claims**



1. A fluid treatment apparatus for textile fibrous material comprising:

a. a pneumatic conveyor duct for textile fibrous material;

b. means for creating an air flow within said duct;

c. a fiber treating chamber forming part of said duct and which includes an outlet opening, an inlet opening and a central passageway which extends between said openings, said inlet opening having a smaller cross section than said central passageway in respective planes which are transverse to the longitudinal axis of said central passageway, said central passageway having a surface which extends from a first point on the periphery of said inlet opening to a second point on the periphery of said outlet opening and extends no further from the longitudinal axis of said central passageway than said first point; whereby said surface is wiped by fiber entering said passageway; and

d. means located adjacent said inlet opening for spraying fiber treating fluid within said central passageway toward

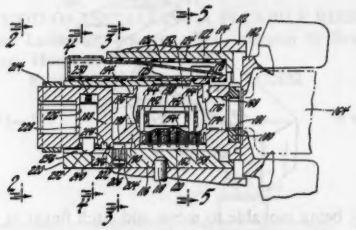
said surface, whereby fibrous material entering said passageway through said inlet opening is treated by said fluid.

4,074,547

LOCK CYLINDER ASSEMBLY

Edward H. Seidewand, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 8, 1976, Ser. No. 748,492
Int. Cl.[2] E05B *15/16*
U.S. Cl. 70—1.5 **4 Claims**



1. In a lock assembly having a lock core rotatable in a cylindrical opening in a housing and locking means acting between the core and the housing to normally lock the core against rotation in the housing and to unlock the core to permit rotation when a properly bitted key is inserted into a key slot of the core, the improvement comprising:

first retaining means acting between the housing and the core to define a normal longitudinal relation therebetween and permit limited axial movement of the core relative the housing upon forced extraction of the core from the housing;

second retaining means acting between the housing and core and being effective upon limited axial movement of the core relative the housing to block further axial movement of the core relative the housing;

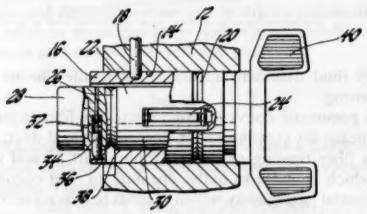
said core having a weakened cross section whereby the core breaks upon forced extraction of the core beyond the range of limited axial movement.

4,074,548

LOCK CYLINDER ASSEMBLY

Thomas J. Milton, Essexville, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 8, 1976, Ser. No. 748,491
Int. Cl.[2] E05B *63/00*
U.S. Cl. 70—1.5 **3 Claims**



1. In a lock assembly having a sleeve mounted on a housing, a lock core rotatable in the sleeve and having a key receiving slot, and locking means acting between the core and the sleeve to normally lock the core against rotation in the sleeve and to unlock the core to permit rotation when a properly bitted key is inserted into the core, the improvement comprising:

frangible retaining means acting between the sleeve and the core to define the normal longitudinal relation therebetween and permit limited axial movement of the core relative the sleeve upon forced longitudinal extraction of the core from the sleeve;

second retaining means acting between the sleeve and core and being effective upon limited axial movement of the core relative the sleeve to block further axial movement of the core relative the sleeve;

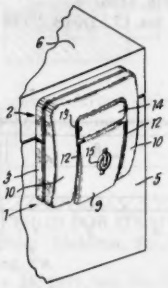
and said sleeve and core having weakened cross sections whereby the sleeve and the core are both broken at their weakened cross sections upon forced axial extraction of the core.

4,074,549

LOCK MECHANISM

Li Sze Yee, Kowloon, Hong Kong, assignor to Kwoon Kwen Metal Ware Company Limited, Kowloon, Hong Kong

Filed Sept. 2, 1976, Ser. No. 719,993
Claims priority, application United Kingdom, Sept. 26, 1975, 39540/75
Int. Cl.[2] E05B *65/48*
U.S. Cl. 70—7 **12 Claims**



1. A lock mechanism comprising a mounting part, a manually operable part, a retaining part and a stabiliser part, said parts being pivotally connected together as a substantially parallelogram linkage with the retaining part and mounting part located on opposed sides of such linkage; the manually operable part, retaining part and stabiliser part of the linkage being pivotable relative to the mounting part between a locking condition, in which the retaining part is intended to engage a component which is to be secured by the mechanism and further in which the operable part is substantially parallel with and lies adjacent to the mounting part, and a release condition in which the retaining part is intended to be dis-engaged from said securable component; pivotal movement of the linkage between its locking and release conditions being effected by manual displacement of the operable part relative to the mounting part; and wherein a lock device is provided on one of said parts to be optionally engageable with a further of said parts by which pivotal movement of the linkage can be prevented when the mechanism is in its locking condition.

4,074,550

VEHICLE IGNITION SWITCH LOCK DEVICE

James W. Rowlings, 93 St. Gregory St., Dorchester, Mass. 02124

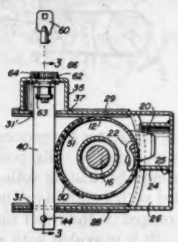
Filed Oct. 7, 1976, Ser. No. 730,641
Int. Cl.[2] B60R *25/00*; H01H *9/28*
U.S. Cl. 70—237 **9 Claims**

1. A vehicle ignition switch lock device installable about the vehicle steering column in surmounting relation to an ignition switch mounted on said steering column, the device comprising:

a solid-walled housing member adapted to fit against a side portion of the steering column, the housing member having an opening disposed in at least a portion of one side thereof, the opening receiving the ignition switch therewithin to substantially cover the ignition switch;

a pair of leg members extending from the housing member on opposite sides of the opening therein, the leg members being tangentially contiguous to the steering column and being of a length greater than the diameter of said steering column, free ends of the leg members lying in spaced opposed relation to each other beyond the edges of the column when the device is mounted on said column, the free ends of the leg members each having an elongated aperture formed therein;

a bar member, the bar member being received within the apertures in the free ends of the leg members, the bar member, the leg members, and the body of the housing member essentially circumscribing the steering column,



the bar member further having an elongated slot formed in one end thereof;

lock means having a positionally displaceable latch member and carried on one of the leg members, the latch member being engageable within the slot in the bar member to lock the bar member to the leg members, thereby to lock the device onto the steering column; and

a shielding member disposed within the housing member and attached to an inner wall thereof, the longitudinal axis of the shielding member being perpendicular to the longitudinal axis of the steering column when the device is mounted on said column, the ingition switch being thereby enclosed and covered by the shield member.

4,074,551

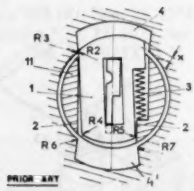
CYLINDER LOCKS HAVING PLATES

Paul Lipschutz, Croissy, France, assignor to Neiman S. A., Courbevoie, France

Continuation of Ser. No. 593,137, July 3, 1975, abandoned. This application Sept. 15, 1976, Ser. No. 723,000

Int. Cl.[2] E05B *29/02*

U.S. Cl. 70—364 R **11 Claims**



1. A cylinder lock having a cylindrical barrel provided with radially slidable plates elastically biased to project from said barrel into at least one groove in the body of the lock, wherein one radial end portion of each said plates projects slightly from the barrel and the other of the radial end portions of each said plates is disposed on the cylindrical surface of said barrel, in the position to which said plates are returned inside the barrel by the insertion of a correctly coded key for the lock to free the lock, said one radial end portion being constituted as means abutting a surface defining said groove to resist picking.

4,074,552

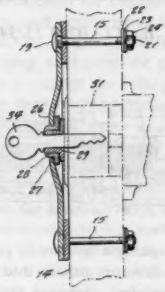
BURGLAR RESISTANCE LOCK ADAPTER KIT

Frank C. Smith, 28-14 Bronx Park East, Apt. 41, Bronx, N.Y. 10467

Filed Jan. 17, 1977, Ser. No. 759,736

Int. Cl.[2] E05B *15/16*

U.S. Cl. 70—417 **3 Claims**



1. A burglar resistance lock adapter kit comprising, in combination, a thin steel plate and a thin steel frame of approximately the same size mounted on a front side of a door by means of carriage bolts and enclosing a rotatable key bushing positioned in front of a tumbler of a lock of said door, an extra long key for insertion through said key bushing and into said lock for unlocking said lock, a sleeve fitted around said key bushing with said key bushing being rotatable within said sleeve, said thin steel plate having a bulging section and a central opening in said bulging section, said sleeve and key bushing extending through said central opening, and flange means on said key bushing and sleeve to retain them behind said bulging section of said thin steel plate.

4,074,553

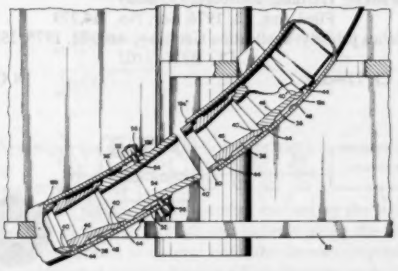
LAYING PIPE

Harold E. Woodrow, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Jan. 3, 1977, Ser. No. 756,361

Int. Cl.[2] B21D *11/00*

U.S. Cl. 72—66 **5 Claims**



1. In a rolling mill, a rotatable laying pipe for forming a longitudinally moving product length into a helix, comprising: at least one rigid curved tubular pipe section having entry and exit ends; liner means axially received in said pipe section for providing a guiding surface for a product length passing through the laying pipe, the said guiding surface being spaced radially inwardly from the inner surface of said pipe section; and, retaining means at the entry and exit ends of said pipe section for axially retaining said liner means in said pipe section.

4,074,554

FASTENER PLACING APPARATUS

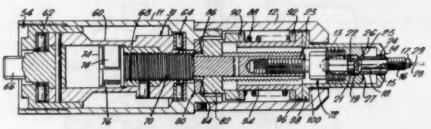
Frederick Arthur Summerlin, Wheathampstead, England, assignor to Aerpat A.G., Zug, Switzerland

Continuation-in-part of Ser. No. 662,873, March 1, 1976, abandoned, which is a continuation of Ser. No. 454,817, March 26, 1974, abandoned. This application Dec. 9, 1976, Ser. No. 749,177

Claims priority, application United Kingdom, Mar. 29, 1973, 15238/73

Int. Cl.[2] B21J *15/34*

U.S. Cl. 72—114 8 Claims



1. Apparatus for placing a fastener by pulling a threaded first part of the fastener towards and/or into a second part of the fastener, which apparatus comprises abutment means having an abutment face for abutting the second part of the fastener and defining a tool axis at right angles to said abutment face, a threaded mandrel for threadedly engaging the first part of the fastener, and a tubular auxiliary member coaxial with said tool axis and surrounding said mandrel with clearance, said auxiliary member being reciprocable along said tool axis relative to said abutment means and projecting forwardly of said abutment means when at the forward end of its reciprocation, said mandrel being reciprocable and rotatable and having limited freedom to move out of alignment with said tool axis, said freedom to move limited by the auxiliary member.

4,074,555

METHOD OF AND APPARATUS FOR IMPROVING HOT-ROLLED SHEET-METAL STRIPS

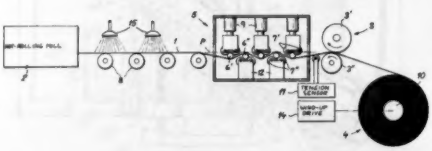
Oskar Noé, Mulheim (Ruhr), Germany, assignor to BWG Bergwerk-und Walzwerk Maschinenbau Gesellschaft mit beschrankter Haftung, Duisburg, Germany

Filed Aug. 13, 1976, Ser. No. 714,279

Claims priority, application Germany, Aug. 21, 1975, 2537188

Int. Cl.[2] B21D *1/02*

U.S. Cl. 72—128 8 Claims



1. A method of improving the quality of a hot-rolled strip of ferrous sheet metal, comprising the steps of:

(a) cooling a hot-rolled strip, on its exit from a rolling mill, to a temperature in an elevated range of substantially 600° to 800° C;

(b) alternatively bending said strip at said temperature in opposite directions with resulting elongation and equalization of deformations due to nonuniform cooling in step (a); and

(c) thereupon winding the strip around a mandrel.

4,074,556

APPARATUS FOR ROLL WORKING

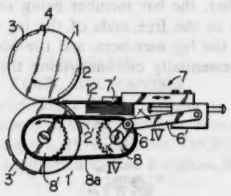
Kouichi Takeda, Okazaki; Hiroshi Sato, and Toshimi Onishi, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Dec. 28, 1976, Ser. No. 755,082

Claims priority, application Japan, Aug. 8, 1976, 51-094351

Int. Cl.[2] B21H *9/00*

U.S. Cl. 72—196 10 Claims



1. A roll working apparatus for processing a work between paired impressions on a pair of rolls, comprising:

a pair of synchronously rotating rolls, wherein one of said rolls is provided with a plurality of male impressions, each of which is arranged on the roller surface thereof, and the other of said rolls is provided with a corresponding number of female impressions, each of which is engageable with one of said male impressions, one after another, during each complete rotation of said pair of rolls;

a plurality of work-positioning means disposed on one of said rolls for regulating the position of the work fed to the rolls;

feeding means for selectively feeding the work to one of said positioning means such that the work can be selectively fed to any desired pair of impressions; and

timing means for controlling the timing of said selective feeding of the work to any desired pair of impressions.

4,074,557

METAL EXTRUSION PROCESS WITH HIGH REDUCTION

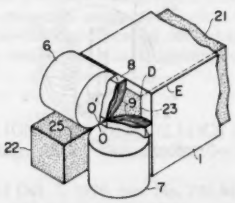
Samon Yanagimoto, Kodaira; Koshiro Aoyagi; Susumu Mizunuma, both of Kitakyushu, and Kouki Nambu, Nohgata, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Oct. 27, 1976, Ser. No. 736,182

Claims priority, application Japan, Oct. 30, 1975, 50-131061; Nov. 5, 1975, 50-133314

Int. Cl.[2] B21B *15/00*

U.S. Cl. 72—206 6 Claims



1. A metal extrusion process for producing a shaped steel product having a sharply angled corner portion by high reduction of a workpiece, comprising:

disposing a plurality of work rolls to form a completely enclosed rotary die;

disposing a forming die at said rotary die, said forming die having an inlet with a cross-sectional shape the same as the cross-sectional shape of the workpiece to be extruded and tapering from said inlet and to said rotary die and having

portions which fill the gaps between end portions of said work rolls on the input side of said rotary die;

feeding a metal workpiece which is at a rolling temperature into a guide container means connected to the forming die and having the cross-sectional shape of the workpiece to be extruded; and

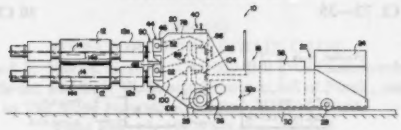
exerting a force on the workpiece for urging it through said guide container means toward said rotary die and through said die and driving said rolls for extruding the metal workpiece continuously through the rotary die.

4,074,558

ROLL CHANGING APPARATUS

Norman L. Pim, Salem, Ohio, assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Feb. 17, 1977, Ser. No. 769,449
Int. Cl.[2] B21B *31/10*
U.S. Cl. 72—239 **22 Claims**



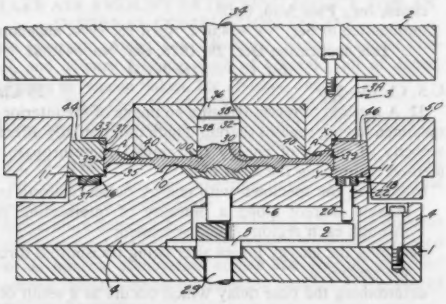
1. Roll changing apparatus for a roll member having an axis and a coaxial roll neck comprising, roll neck engaging means having an axis and vertically aligned diametrically opposed axially spaced apart lower and upper load bearing surface means for respectively engaging diametrically opposed axially spaced apart lower and upper portions of said roll neck, said lower portion being spaced axially inwardly along said roll neck from said upper portion, support means movable axially of said roll member, means mounting said roll neck engaging means on said support means for pivotal movement about a horizontal axis perpendicular to said axis of said roll neck engaging means, and means for pivoting said roll neck engaging means and thus said load bearing surface means about said horizontal axis between first and second positions, said load bearing surface means in said first position freely receiving said roll neck therebetween and in said second position engaging said portions of said roll neck to support said roll member as a cantilever.

4,074,559

FORGING METHOD

David J. Beane, and Ronald M. Kaplan, both of North Palm Beach, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 635,181, Nov. 25, 1975, Pat. No. 4,051,708. This application Nov. 22, 1976, Ser. No. 744,069
Int. Cl.[2] B21K *1/32*
U.S. Cl. 72—354 **3 Claims**



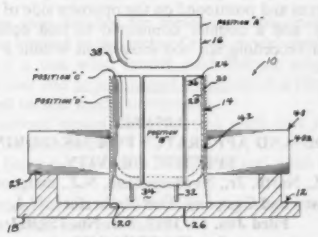
1. In combination, an apparatus for forming a disc with integral blades from a preformed forging having one finished side surface and one side surface with a finished inner surface and an enlarged unfinished outer surface including a press, lower die means, upper die means, rim die means, said lower die means comprising a die portion for supporting one finished side surface, said upper die means having a center inner die portion for engaging said finished inner surface and a separate outer die portion therearound for engaging said enlarged unfinished outer surface, said center inner die portion having a finished forging surface to mate with the finished inner surface of the preformed forging, said outer die portion having a finished forging surface to engage the enlarged unfinished outer surface, said rim die means having radially extending blade cavities, means for holding said center inner die portion against the finished inner surface of the preformed forging while pressing the outer die portion downwardly against the enlarged unfinished outer surface to provide a finished outer surface and press the material into the blade cavities, said center inner die portion having an upwardly facing surface, said outer die portion having a part extending radially inwardly over said upwardly facing surface, said part extending radially inwardly being spaced from said upwardly facing surface, deformable means being placed between said part extending radially inwardly and said upwardly facing surface to limit the forces transmitted between said outer die portion as it moves downwardly and said center inner die portion by deformation of the deformable means.

4,074,560

APPARATUS AND METHOD FOR SIZING STATOR BORES

Hollis D. Sisk, 329 Ridge Meadow, Chesterfield, Mo. 63017

Filed Nov. 22, 1976, Ser. No. 744,443
Int. Cl.[2] B21D *41/02*
U.S. Cl. 72—393 **3 Claims**



1. Apparatus for sizing stator bores for electric motors comprising:

a support member;

an elongated tubular sleeve member carried by the support member extending through and entirely along the length of a bore formed in a stator core, the sleeve comprising a first elongated portion having a first diameter including a plurality of elongated segments extending substantially along the length of the sleeve member terminating at a second portion having a second diameter greater than the first diameter; and

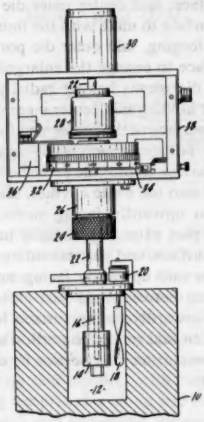
sizing plug means for insertion substantially through the sleeve member in interference-fitting relationship with the elongated segments for radially expanding the first portion of the sleeve member outwardly toward the second diameter of the second portion for forming a substantially constant diameter sleeve member along the entire length of the bore.

4,074,561

MEANS FOR MEASURING THE PLASTICITY OF COAL

Willis H. Brockschmidt, Downers Grove; Robert W. Brockschmidt, Lisle, and John D. Grabenhofer, Addison, all of Ill., assignors to Fuel Research & Instrument Co., Villa Park, Ill.

Filed Nov. 15, 1976, Ser. No. 741,790
Int. Cl.[2] G01N *25/04*
U.S. Cl. 73—17 R **5 Claims**



1. A means for measuring the plastic characteristics of coal including a bath of molten metal, a crucible with a coal sample therein positioned in said bath, a stir rod in said coal sample and a drive motor for said stir rod, and means for measuring movement of the stir rod as the coal plasticizes, including a calibrated disc having a uniformly slotted periphery operatively engaged for rotation with said stir rod, means for counting the number of revolutions of said calibrated disc, optical sensing means positioned adjacent said disc, including a pair of spaced light sources positioned on one side of said slotted periphery and a pair of spaced phototransistors, in alignment with said light sources and positioned on the opposite side of said slotted periphery, and a counter connected to said optical sensing means for recording stir rod movement within a given time reference.

4,074,562

METHOD AND APPARATUS FOR MEASURING FLUID SPECIFIC GRAVITY

Howard L. North, Jr., Newfoundland, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Jan. 13, 1977, Ser. No. 759,011
Int. Cl.[2] G01N *9/00*
U.S. Cl. 73—32 A **19 Claims**

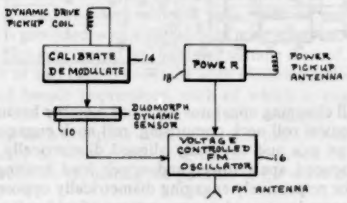
1. Apparatus for measuring fluid specific gravity comprising; a housing, a hollow tube mounted in the housing and open at both ends, means on the housing for communication with a source of fluid to be introduced into one end of the hollow tube, means on the housing for connection of pressure differential means to the other end of the hollow tube for causing fluid to flow from the fluid source into the hollow tube, vibration means for vibrating the tube containing the fluid at its natural resonant frequency by the interaction of the magnetic field generated by alternating current passed through the tube and a steady magnetic field generated by a permanent magnet, temperature sensing means for automatically compensating for fluid temperature differences affecting sample density and vibrating tube elastic modulus and response means to measure the vibration frequency of the tube and sample therein and compare the measurement with a predetermined reference frequency correlated to the substance on whose density the specific gravity is based to determine the specific gravity of the fluid.

4,074,563

IN-SITU MEASUREMENT APPARATUS

Herman P. Briar, Rancho Cordova, and Kenneth W. Bills, Jr., Sacramento, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 12, 1976, Ser. No. 731,484
Int. Cl.[2] G01N *33/22*
U.S. Cl. 73—35 **10 Claims**



1. An in-situ measurement apparatus for solid fuel rocket engines comprising in combination:

an excitation means generating a power signal and dynamic drive signal, said power signal and said dynamic drive signal being combined to provide an R.F. field, said R.F. field being radiated by said excitation means,

a sensing means embedded in the propellant mass of a solid fuel rocket engine, said sensing means receiving said R.F. field, said sensing means extracting said power signal and said dynamic drive signal from said R.F. field, said sensing means utilizing said dynamic drive signal to provide a data signal, said sensing means utilizing said power signal to modulate said data signal, said sensing means transmitting said modulated data signal, and,

a signal processing means to receive said modulated data signal, said signal processing means demodulating said modulated data signal to provide said data signal, said data signal representing the state of said propellent mass.

4,074,564

RECONSTRUCTION SYSTEM AND METHOD FOR ULTRASONIC IMAGING

Weston A. Anderson, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 464,072, April 25, 1974, abandoned. This application Dec. 29, 1975, Ser. No. 645,061
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—596 **39 Claims**

32. A method of reconstructing an image of the interior of a specimen having regions therein which differentially affect the velocity of pulses of energy transmitted therethrough, said method comprising the steps of:

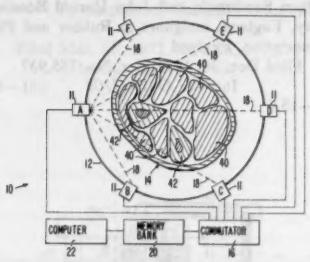
irradiating the specimen with energy pulses, causing transmission thereof along a plurality of intersecting paths through each region of said specimen;

detecting the energy pulses after being transmitted through the specimen;

determining the time delay which occurs as a result of the pulses being transmitted through the specimen; and

mathematically reconstructing the differential velocity coef-

ficients for the regions which differentially affect the velocity of the pulses transmitted through the specimen to



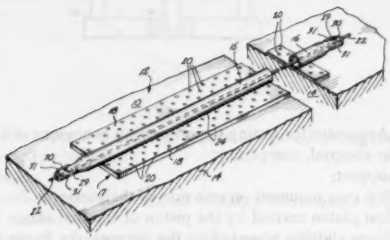
provide an image of the internal spatial relationships within said specimen.

4,074,565

VIBRATORY-WIRE STRAIN GAGE

Richard K. Harris, Seattle; (Charles) Bill (William) Jewsbury, Bellevue, and Dale W. Shoup, Edmonds, all of Wash., assignors to The Slope Indicator Company, Seattle, Wash.

Filed Feb. 17, 1977, Ser. No. 769,543
Int. Cl.[2] G01B 7/16
U.S. Cl. 73—88.5 R **6 Claims**



1: A vibratory-wire strain gage, comprising:

an elongated metallic base strip adapted for rigid attachment to a structural member;

a metal tube having one side rigidly fused to said strip along its length;

a vibratory-wire extending coaxially through said tube in spaced apart relation to the inner wall thereof;

each end of said tube being collapsed into squeezegripping relation to the wire end therein; and

said wire having a predetermined tension which is maintained by said gripping relations.

4,074,566

INTAKE AIR AMOUNT DETECTING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Hideki Obayashi, Aichi; Tokio Kohama, Nishio; Tadashi Hattori, and Minoru Nishida, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

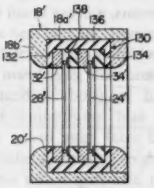
Filed Oct. 26, 1976, Ser. No. 735,885
Claims priority, application Japan, Nov. 1, 1975, 50-131922
Int. Cl.[2] G01F 1/68
U.S. Cl. 73—116 **5 Claims**

1. An intake air amount detecting device for an internal combustion engine, comprising:

a temperature detector housing including a housing member of a heat-insulating material disposed within an intake pipe of an internal combustion engine and defining first and second through-holes substantially parallel to the axis of said intake pipe;

first and second shock-absorbing sleeves of a shock-absorbing material having outer faces disposed in face-to-face contacting relationship with the inner surfaces of said first and second through-holes, respectively;

at least one electric heater supported by said shock-absorbing sleeve and including heat generating wire means disposed within said first shock-absorbing protective sleeve;



a first temperature detecting element supported and disposed within said first shock-absorbing protective sleeve downstream of said electric heater;

said first and second through-holes being substantially thermally insulated from each other; and

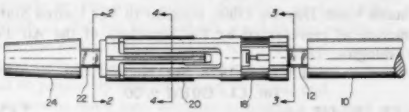
a second temperature detecting element supported by and disposed in said second shock-absorbing protective sleeve.

4,074,567

LOW INTERACTION WIND TUNNEL BALANCE

Eugene V. Horanoff, Clarksville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 6, 1977, Ser. No. 794,506
Int. Cl.[2] G01M 9/00
U.S. Cl. 73—147 **23 Claims**



1. A strain gage balance for measuring component forces and moments applied to the body of a test model disposed in a flow field of a test wind tunnel, said balance adapted for mounting at one end to said tunnel by means of a sting and at the other end to said model comprising:

first and second means for measuring pitch and yaw load applied to said model,

said sting being connected to the first of said pitch and yaw means,

a roll moment measurement section integrally connected to said first pitch and yaw means,

said roll section having a plurality of torsion webs spaced at the upper and lower periphery of said roll section and capable of allowing twist deflections for the balance for roll load measurement but providing a constraint on deflections along the pitch and yaw axes,

a plurality of beams connecting the forward and aft nonwebbed portions of said roll section, said beams consisting of a support beam integral with the forward portion of said roll section, said support beam having a recess therein defining a thin beam, a thin intermediate beam integral with said thin beam, said intermediate beam being integrally connected to a roll gage beam capable of deflection in response to a rolling moment, whereby said thin beam has the capability of reducing any deflections induced in said roll gage beam due to an axial force or pitching moment, said intermediate beam is capable of reducing any side force and yaw load which said roll gage beam may experience;

an axial force measurement cage attached to said roll section, said axial cage being integral with said second pitch

and yaw means, said axial cage having longitudinal beams of cruciform construction acting as an integral unit, a plurality of axial deflection beams integrally formed with said longitudinal beams allowing said longitudinal beams to respond as a unit under an axial force without transmitting roll moments or pitch and yaw loads, a central beam fixed to said roll section and integrally formed with said axial deflection beams, a cross beam integrally connected to said central beam at one end and at its other end to an axial gage beam which is capable of deflection in response to an axial force, said axial gage beam also being integrally formed with said longitudinal beams via thin flexure beams, whereby said longitudinal beams transmit said axial load to said axial gage beam, said axial deflection beams being capable of carrying pitch, yaw loads and roll moments without allowing much deflection of the axial gage beam due to pitch, yaw loads and roll moments acting on said model, said thin flexure beams, acting like pin joints, reduce interaction and transmit the axial force loading to said axial gage beam, and;

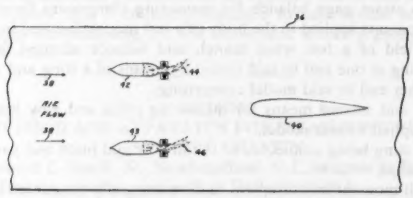
means responsive to the deflection of said roll and axial gage beams for indicating the magnitude and direction of said rolling moments and axial forces, respectively.

4,074,568

FLUIDIC OSCILLATING JET FOR HIGH FREQUENCY GUST TUNNEL

Hermann Viets, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 7, 1976, Ser. No. 684,429
Int. Cl.[2] G01M 9/00
U.S. Cl. 73—147 **7 Claims**



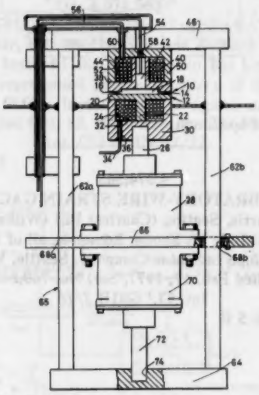
4. An apparatus for gust response testing of an aerodynamic test device, comprising: a gust wind tunnel having a flow of gas therethrough at a predetermined velocity with the test device positioned in the gas flow; a plurality of fluidic nozzles within said gust tunnel upstream of said test device; each of said fluidic nozzles having an elongated exit port; means for directing a flow of gas through the elongated exit port of each nozzle; a first elongated control port positioned on one side of said exit port of each nozzle; a second elongated control port on the side of said exit port opposite from said first control port of each nozzle; a first elongated flow attachment plate extending forward of said first control port in the direction of gas flow from said exit port of each nozzle; a second flow attachment plate extending forward of said second control port in the direction of gas flow from said exit port of each nozzle; means for alternately admitting ambient gas surrounding said nozzle members to said first control port and said second control port of each nozzle with a predetermined phase relation between the nozzles.

4,074,569

APPARATUS FOR DETERMINING MATERIAL PROCESSING CHARACTERISTICS

Ronald William Sambrook, and John Harold Beesley, both of Shrewsbury, England, assignors to Rubber and Plastics Research Association, England

Filed Dec. 30, 1976, Ser. No. 755,937
Int. Cl.[2] G01N 3/08
U.S. Cl. 73—15.6 **8 Claims**



1. Apparatus for testing the processing behaviour of a viscoelastic material, comprising:

a support;

a first ram mounted on one side of the support;

a first platen carried by the piston of the first ram;

a frame slidably mounted on the support, the frame including elgonate side members slidably received in said support for enabling relative sliding between the frame and support in a direction parallel to the direction of displacement of the piston of said first ram, a first end member disposed on said one side of said support and a second end member disposed on the other side of the support;

a second platen carried by said first end member of the frame and disposed adjacent said first platen for defining a test chamber therebetween;

a second ram disposed on the other side of said support between the support and said second end member and with its piston displacement direction parallel to that of said first ram, said first and second rams being displaceable through first and second predetermined distances respectively,

means for activating said first and second rams in timed sequence,

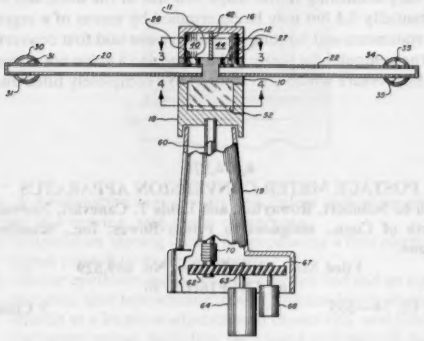
and a pressure transducer carried by one of said platens for providing an electrical signal representative of the instantaneous load in a test sample when placed in said test chamber,

the arrangement being such that actuation of the second ram causes relative displacement of the frame and support to bring the first and second platens into first relative positions wherein they are spaced apart by a first predetermined distance and subsequent actuation of the first ram displaces the first platen relative to the support to bring the first and second platens into second relative positions wherein they are spaced apart by a second, smaller predetermined distance.

4,074,570
FLUID SPEED MEASURING APPARATUS

John L. Beilman, Lancaster, and William R. Deazley, Cowlesville, both of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

Filed Mar. 15, 1977, Ser. No. 777,876
Int. Cl.[2] G01C 21/10
U.S. Cl. 73—182 11 Claims



1. A fluid speed indicating apparatus for mounting on a movable body comprising:

hub means;

a first pair of generally aligned, tubular arms mounted in said hub means;

a second pair of generally aligned, tubular arms mounted in said hub means perpendicular to said first pair of arms;

means for rotating said hub means and thereby said first and second pairs of arms at a substantially constant angular speed;

four fluid pressure sensing means mounted respectively to each arm of said first and second pair of arms at the same radial distance;

first pressure responsive means operatively connected to said fluid pressure sensing means attached to said first pair of arms for sensing the steady state pressure difference between the fluid pressure sensing means attached to said first pair of arms and for producing a first signal whose amplitude is proportional to the magnitude of the velocity of fluid flow past said fluid pressure sensing means attached to said first pair of arms;

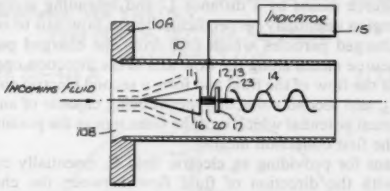
second pressure responsive means operatively connected to said fluid pressure sensing means attached to said second pair of arms for sensing the steady state pressure difference between the fluid pressure sensing means attached to said second pair of arms and for producing a second signal whose amplitude is proportional to the magnitude of the velocity of fluid flow past said fluid pressure sensing means attached to said second pair of arms;

whereby the amplitude of said first and second signals is proportional to the magnitude of the velocity of flow past said fluid pressure sensing means and varies at the rotational frequency at which said means for rotating said hub means is rotating said first and second pair of arms and the complete sine and cosine components of the velocity of the body are obtained.

4,074,571
OBSTACLE ASSEMBLY FOR VORTEX TYPE FLOWMETER

Thomas H. Burgess, Horsham, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed Aug. 1, 1974, Ser. No. 493,855
Int. Cl.[2] G01F 1/00
U.S. Cl. 73—194 B 2 Claims



1. A flowmeter of the vortex type comprising:

(A) a flow tube through which fluid to be measured is conducted;

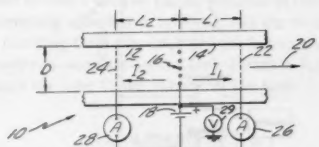
(B) an obstacle assembly disposed within said tube and constituted by a front section fixedly mounted across the tube and contoured to cause flow separation and downstream vortices having a periodicity which is a function of flow rate, and a rear non-streamlined section behind said front section and extending across said tube to define a gap with respect to said front section, said rear section having a tail extending across said tube and projecting from said rear section, said rear section being in strip form and defining with said tail a T-shaped body in which the strip is the base and extends across said tube and the tail is the leg and extends in the longitudinal direction in said tube, the length of said leg being about equal to the width of said base, the dimensions of said tail relative to said rear section being such as to produce surges in a path going around the tail to positively reinforce said vortices, and

(C) means to sense said vortices to produce a signal whose frequency is proportional to flow rate.

4,074,572
METHOD AND APPARATUS FOR SENSING THE FLUX OF A FLOWING FLUID

Robert H. Bullis, Avon; Russell G. Meyerand, Jr., and Walter J. Wiegand, Jr., both of Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed July 28, 1975, Ser. No. 599,560
Int. Cl.[2] G01F 1/64
U.S. Cl. 73—194 F 16 Claims



1. Apparatus for determining the flux of a fluid having a particle density N comprising:

means for providing a region having an axis along which the fluid flows in passing therethrough, the region having a cross sectional area A which is perpendicular to the axis;

charged particle source means capable of maintaining an electric potential V and extending essentially perpendicular to the flow axis to provide charged particles in the fluid adjacent to the source means;

first collection means separated from the charged particle source means by a distance L_1 and extending across the region essentially perpendicular to the flow axis to collect charged particles which drift from the charged particle source means along the flow axis in the direction of flow of the fluid and form a first electric current, I_1, said first means being capable of either a positive or negative electric potential with respect to the charged particle source means;

second collection means separated from the charged particle source means by a distance L_2 and extending across the region essentially perpendicular to the flow axis to collect charged particles which drift from the charged particle source means along the flow axis in the direction opposite to the flow of the fluid and form a second electric current, I_2, said second collection means being capable of an electrical potential which is of the same sign as the potential of the first collection means;

means for providing an electric field E, essentially coaxial with the direction of fluid flow between the charged particle source means and both the first and second collection means to induce charged particles to drift parallel to the axis toward the first and second collection means, the strength of the field E and the pressure of the fluid P allowing the operating range in the ratio E/P to cause the ion mobility at standard conditions of temperature and pressure to remain constant between the first and second collection means;

means for sensing the first electric current I_1;

means for sensing the second electric current I_2; and

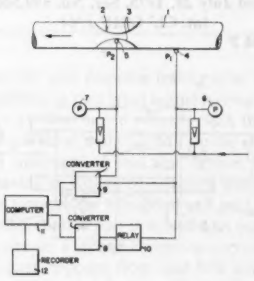
means for sensing the potential difference between the charged particle source means and the first and second collection means to allow a combining of I_1, I_2 and V with the apparatus parameters A, L_1 and L_2, and the number density of particles at standard conditions N_o, with the standard ion mobility of the fluid, to directly relate the fluid flux passing through the area A to the ratio of the difference in the electric currents, (I_1-I_2) to the sum of the electric currents, (I_1+I_2).

4,074,573

METHOD AND APPARATUS FOR THE MEASUREMENT OF VOLUMETRIC FLOWRATE IN PIPES AND DUCTS

Benedikt Nordhofen, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 24, 1976, Ser. No. 717,074
Claims priority, application Germany, Sept. 10, 1975, 2540223
Int. Cl.[2] G01F *1/36*
U.S. Cl. 73—205 R **1 Claim**



1. An apparatus for the measurement of the volumetric flowrate in a duct having a throttle device therein; said apparatus comprising: a first and a second pressure device for measuring pressure; means connecting said first pressure device upstream of the throttle device; means connecting said second pressure device at said throttle device; said first pressure device being operable to measure a pressure p_1 and said second pressure device being operable to measure a pressure p_2; a first signal converter connected to said pressure devices for producing a first electric signal representative of the pressure p_1; a second signal converter connected to said pressure devices for producing a second electric signal representative of the pressure difference p_1-p_2, lead means for connecting said first and second converters to a computer to apply said first and second electric signals thereto, said computer being of the type for producing a signal F according to the relation

$$F=A(p_1-p_2)+B(p_1-p_2)^n+C(p_1-p_2)^n\cdot p_1+D$$

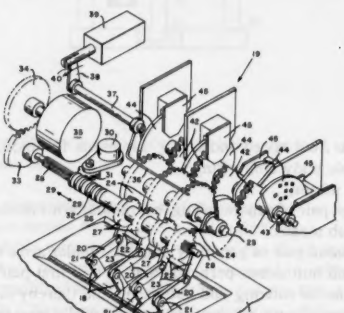
wherein A, B, C and D are empirically determined constants that vary according to the shape and size of the duct, and n is substantially 0.5 but may be determined by means of a regression statement; and limiting means between said first converter and the computer for limiting the value p to a value not exceeding the pressure which corresponds to a completely filled duct.

4,074,574

POSTAGE METER CONVERSION APPARATUS

Keith E. Schubert, Rowayton, and Louis T. Canevari, Norwalk, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Mar. 23, 1976, Ser. No. 669,529
Int. Cl.[2] F16H *5/96*
U.S. Cl. 74—335 **9 Claims**



1. A postage meter conversion apparatus for converting a lever operated mechanical postage meter into an electrically controlled postage meter, said conversion apparatus comprising:

a drive shaft having a cylindrical rack on one end thereof, and a plurality of spaced apart drive gears on an opposite end thereof;

a first motor operatively connected to said drive shaft for rotatively driving said drive shaft and each of said drive gears;

a pinion gear in driving engagement with said rack of said drive shaft for axially moving said drive shaft to a number of drive gear actuating positions;

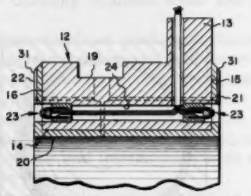
a second motor operatively connected to said pinion gear for rotatively driving said pinion gear to axially move said drive shaft; and

an output shaft having a plurality of spaced apart, drivable gears, each of said drivable gears being operatively connected to a lever of said postage meter, each of the drivable gears being individually driven by one of said drive gears, each drive gear being associated with a particular drivable gear and being in rotative engagement therewith as said drive shaft is caused to axially move to a particular drive gear actuating position.

4,074,575
TEMPERATURE AND FAILURE INDICATING PROBE FOR A BEARING

Mark Otho Bergman, and Paul Clement Rentmeester, both of La Crosse, Wis., assignors to The Trane Company, La Crosse, Wis.

Filed Oct. 12, 1976, Ser. No. 731,857
Int. Cl.[2] G01K 1/08; H01H 3/16
U.S. Cl. 73—344 6 Claims



1. A combination temperature and failure indicating probe for use in a bearing, said probe comprising:

a. temperature sensing means for producing a first electrical signal related to its temperature;

b. tubular enclosure means having a closed end and an opposite end, said temperature sensing means being disposed therein at a location adjacent said closed end, said tubular enclosure means, including the closed end thereof, being constructed of a material which is electrically conductive and therefore capable of receiving a second electrical signal;

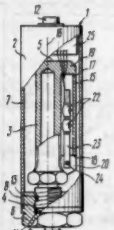
c. electrical conductor means connected to said temperature sensing means and to said tubular enclosure means for carrying said first and second electrical signals to a point of use; and

d. mounting means for supporting said tubular enclosure means in a bearing, said mounting means being constructed of electrically insulating material.

4,074,576
FLUID PRESSURE MEASURING DEVICE

Lev Dmitrievich Bryzzhev, ulitsa Artema, 20/22, kv. 21, and Viktor Semenovich Kupko, prospekt Traktorostroitelei, 160, kv. 270, both of Kharkov, U.S.S.R.

Filed July 28, 1975, Ser. No. 599,852
Int. Cl.[2] G01L 9/12
U.S. Cl. 73—702 11 Claims

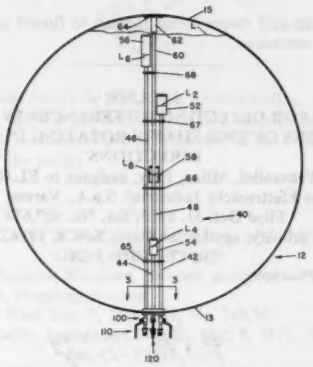


1. A fluid pressure transducer comprising: a housing; a resilient member located in said housing and made in the form of a sleeve whose open end receives a fluid the pressure of which is to be measured; a vibrating member in the form of a strip and having end faces, said vibrating member being located on a side surface of said resilient member and being parallel to its axis; two supports for securing the end faces of the vibrating member to said resilient members; an excitor located in said housing and intended to induce oscillations in said vibrating member, said excitor including means for generating a signal having a frequency which varies under the effect of the fluid pressure upon said resilient member by a value proportional to the variation in the vibrating member oscillation frequency.

4,074,577
SAMPLING ASSEMBLY FOR TAKING A SAMPLE OF LIQUID AT A DESIRED LEVEL IN A TANK

John A. Krug, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Mar. 30, 1977, Ser. No. 782,647
Int. Cl.[2] G01N 1/16
U.S. Cl. 73—421 B 11 Claims



1. A sampling assembly for taking a sample from a desired level in a tank comprising:

at least one tube extending from the outside of the tank to a selected level within the tank; the inner end of said tube being in fluid communication with a sampling chamber; said sampling chamber having a sampling chamber opening in its lower portion in communication with the inside of the tank; sampling valve means for removing a sample from the tube located at the outer end portion of the tube; whereby when the tank is not loaded, air enters the sampling chamber and the tube from within the tank through said sampling chamber opening and/or from the outside of the tank when the sampling valve is open; the volume of said sampling chamber and said tube being such that air is compressed in the tube and in the sampling chamber as the tank is filled with liquid; said compressed air preventing the liquid from entering the tube through said sampling chamber opening when the tank is being loaded with liquid; and whereby when the sampling valve means is opened to take a sample, the air pressure in the tube and in the sampling chamber is relieved, and the pressure in the tank resulting from the weight of the lading and/or superatmospheric pressure in the tank forces a liquid sample through the tube to the outside of the tank.

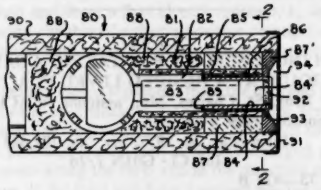
4,074,578
MOLTEN METAL SAMPLER

William J. Collins, 7005 Madison St., Merrillville, Ind. 46410

Division of Ser. No. 595,155, July 11, 1975, Pat. No. 4,002,073.
This application May 26, 1976, Ser. No. 690,055
Int. Cl.[2] G01N 1/12
U.S. Cl. 73—425.4 R 16 Claims

1. A device for obtaining a sample of molten metal, said device comprising an elongated tubular open ended casing, wall structure disposed in said casing and forming a chamber and a tubular extension, an inner tube secured in said extension, an outer tube secured about said first tube and having an entrance for initially receiving molten metal for flow through the

tubes into said chamber, means secured in and to said casing and provided with an opening affording access to said entrance, and said means being formed to funnel molten metal into said entrance.

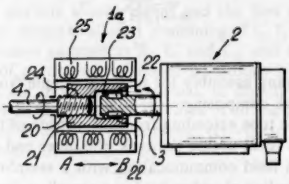


4,074,579

DEVICE FOR DETECTING DIFFERENCES IN ANGULAR POSITIONS OF TWO SHAFTS ROTATING IN OPPOSITE DIRECTIONS

Luciano Franzolini, Milan, Italy, assignor to EL.GE. Apparecchiature Elettroniche Industriali S.p.A., Varese, Italy

Filed Oct. 31, 1975, Ser. No. 627,658
Claims priority, application Italy, Nov. 8, 1974, 29228/74
Int. Cl.[2] G01P *3/08*
U.S. Cl. 73—507 **2 Claims**



1. A device for detecting the difference in the rotary speeds of two rotating shafts, comprising means for coaxially mounting the two shafts for rotation in the same direction, a low power precision stepping motor for imparting a programmed speed of rotation to one of the shafts, means interconnecting the shafts and displaceable in response to a change in the relative angular position of the two rotating shafts, the interconnecting means comprising a bush of magnetic material and acting as the core of a differential transformer freely axially movably mounted on the one shaft and corotational therewith, the bush having an internally threaded portion, and an externally threaded screw portion on the other shaft, the externally threaded screw portion and the internally threaded push portion meshing to form an axially displaceable interconnection, and an immobile sensor fixedly mounted adjacent the interconnecting means, the sensor being mechanically disconnected from the interconnecting means and arranged to detect displacement of the interconnecting means in response to the change in the relative angular position of the rotating shafts.

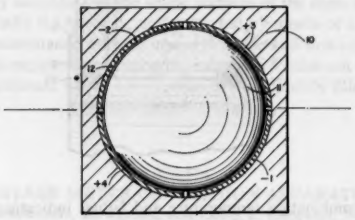
4,074,580

ELECTROSTATIC PICKOFF SYSTEM FOR BALL GYROS OF THE ELECTROSTATIC LEVITATION TYPE

Joseph C. Boltinghouse, Whittier, and James L. Atkinson, La Mirada, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 47,506, June 18, 1970, abandoned. This application Dec. 19, 1975, Ser. No. 642,502
Int. Cl.[2] G01C *19/28, 19/30, 19/46*
U.S. Cl. 74—5.6 D **14 Claims**

1. A gyroscope comprising:
a case;
a ball adapted to be spun about a spin axis, said ball being provided with a radial unbalance so that said ball orbits as it spins about the spin axis;
a set of electrostatic electrodes disposed within said case and in a three dimensional array about said ball;
circuit means for establishing electrical field signals between said electrodes and said ball;
pickoff means associated with said electrodes and responsive to the approach and recession of said ball for modulating the electrical field signals between said ball and said electrodes in a phase and amplitude pattern unique to the particular orientation of the spin axis of said ball relative to said electrodes;



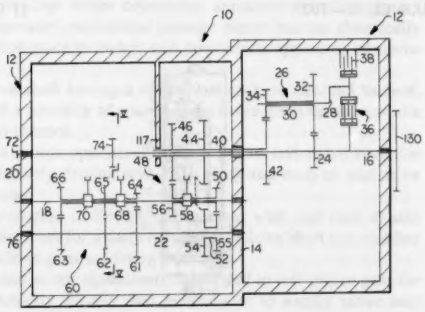
signal circuits coupled to said pickoff means for demodulating the modulated electrical field signals to develop demodulated signals;
means responsive to the demodulated signals for developing phase information signals indicative of the attitude of the spin axis of said ball relative to said set of electrodes; and
computing means responsive to the phase information signals for computing the attitude of the spin axis of said ball relative to said set of electrodes.

4,074,581

COMPACT TRANSMISSION HAVING A POWER TAKEOFF SHAFT AND HYDRAULICALLY ACTUATED CLUTCHES

W. Gene Stevens, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 11, 1976, Ser. No. 685,475
Int. Cl.[2] F16H *3/08, 37/00*
U.S. Cl. 74—15.66 **8 Claims**



1. A vehicle transmission comprising:
a housing including first, second and third generally parallel wall members;
input shaft means transpiercing generally normally and journalled in said first, second and third generally parallel wall members;
an output shaft journalled in said second wall member and journalled and transpiercing said third wall member, said

output shaft disposed in a generally parallel relation to said input shaft;

a first sun gear drivingly associated with said input shaft means;

an intermediate output shaft coaxially mounted about said input shaft means and journalled in said second wall member;

a second sun gear drivingly mounted on said intermediate output shaft, said first and second sun gears disposed between said first and second generally parallel wall members;

a planet carrier coaxially mounted about said input shaft means;

a plurality of clustered planet gears each cluster rotatably mounted on said planet carrier and each cluster comprised of a first planet gear and a second planet gear integrally formed one with the other, said first planet gear intermeshing with and driven by said first sun gear, said second planet gear having a different number of drive teeth than said first planet gear and intermeshing with and driving said second sun gear;

first clutch means for selectively connecting said planet carrier with said input shaft means to rotate said intermediate output shaft at a speed equal to said input shaft means;

first brake means for selectively stopping rotation of said planet carrier relative said input shaft means to allow said plurality of second planet gears to rotate said intermediate output shaft at a different speed than said input shaft means;

a countershaft journalled in generally parallel relation to said input shaft means between said second and third wall members;

a directional drive section driven by said intermediate output shaft comprising a forward pinion gear drivingly mounted on said intermediate output shaft, a reverse pinion gear drivingly mounted on said intermediate output shaft, a forward driven gear rotatably mounted on said countershaft, a reverse driven gear rotatably mounted on said countershaft and in intermeshing relationship with said reverse pinion gear, a reversing cluster gear rotatably mounted on said output shaft including a first gear in intermeshing relationship with said forward pinion gear and a second gear integrally formed with said first gear and intermeshing with said forward driven gear, and directional drive engagement means associated with said countershaft and selectively movable in a first direction for drivingly engaging said forward driven gear with said countershaft and selectively movable in a second direction for drivingly engaging said reverse driven gear with said countershaft; and

a plurality of speed-reducing drive means selectively engageable with said countershaft for rotating said output shaft at differing rotational speeds relative said countershaft,

wherein the transmission housing further comprises a half-wall between the second and third walls, and further wherein the intermediate output shaft is journalled in said half wall.

4,074,582

HOISTING DEVICE

Manfred Harig, Lindlar-Linde, Germany, assignor to N.V. Western Gear Europe S.A., Aartselaar, Belgium

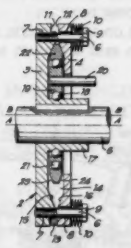
Filed Sept. 13, 1976, Ser. No. 722,764

Claims priority, application Belgium, Sept. 26, 1975, 254583; Dec. 1, 1975, 254684

Int. Cl.² F16H *55/36, 55/52*

U.S. Cl. 74—230.24 **27 Claims**

1. Hoisting device, characterized by the fact that it mainly consists of a housing to which the load is suspended, and in this housing a driving pulley consisting of two half pulleys for the cable, which is suspended from a fixed point, whereby this driving pulley is provided with means which press the cable uniformly or practically uniformly into the driving pulley over a large arc, and with means which press aforesaid half pulleys away from each other at the locations where the cable enters and leaves the pulley, in such a manner that no friction occurs



when the cable enters or leaves the driving pulley, whereby this pressing apart is performed in such a manner that no or practically no increase of pressure occurs on the other side of the pulley.

4,074,583

COMPOSITE EPICYCLIC GEAR RING AND METHOD OF MANUFACTURE

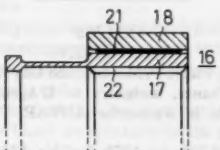
Hans-Erik Hansson, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Filed Dec. 7, 1976, Ser. No. 748,781

Claims priority, application Sweden, Dec. 9, 1975, 7513832

Int. Cl.² F16H *1/06*

U.S. Cl. 74—413 **4 Claims**



1. An inner-toothed ring for an epicyclic gear comprising a plurality of concentric ring elements arranged one within the other and clamped together by shrink fitting one ring to another, the average cross-sectional area of the concentric ring elements being about $hbn^{-1/2}$, where n is the number of ring elements and h and b are the radial thickness and width of a theoretical single element ring which has the same stress level under radial loading as each one of said plurality of concentric ring elements in a ring having n concentric ring elements.

4,074,584

DOMESTIC FOOD MIXERS

David William Bushnell, 15 Fifth Avenue, Denvilles, Havant, Hampshire, England

Filed Nov. 5, 1976, Ser. No. 739,306

Int. Cl.² F16H *1/12, 1/20*

U.S. Cl. 74—421 A **8 Claims**

1. A domestic food mixer comprising, in combination:

(a) a plastics material housing including a base portion and a cover portion;

(b) locating elements on said base portion;

(c) means defining a pair of apertures adjacent one end of the base portion;

(d) a bearing plate secured in the base portion of the housing in overlying relation to said apertures;

(e) a pair of pinions each having a lower axial shaft extending on the lower side of the pinion and an upper axial shaft

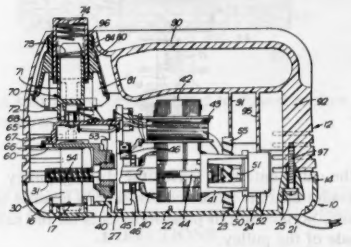
extending on the upper side of the pinion, the lower axial shaft being located in one of the apertures and having a shoulder resting on said bearing plate, said upper axial shaft having a shoulder thereon;

(g) an electric motor;

(h) a frame of said electric motor resting on said locating elements on said base portion;

(i) an armature shaft on said electric motor;

(j) a drive worm on said armature shaft engaged between said pinions;



(k) a mounting plate forming part of said electric motor frame, said mounting plate having means defining two apertures therein, one engaging each upper axial shaft, the mounting plate engaging on the shoulders of the upper axial shaft;

(l) abutments means on the cover portion of the housing engaging said electric motor; and

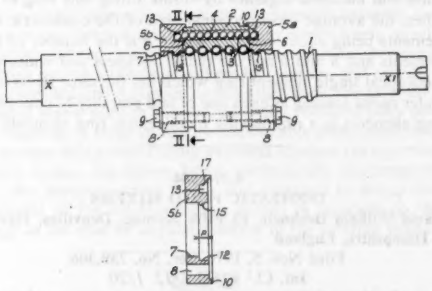
(m) securing means holding the cover and base portions together, whereby said pinions and electric motor are held in place.

4,074,585

BALL SCREW

Aimé A. Richaud; Pierre F. Moreno, and Guy A. Rimbaud, all of Forcalquier, France, assignors to L'Agence Nationale de Valorisation de la Recherche ANVAR, Neuilly-sur-Seine, France

Filed Feb. 24, 1975, Ser. No. 552,209
Claims priority, application France, Feb. 26, 1974, 74 06446
Int. Cl.² F16H *1/18*
U.S. Cl. 74—424.8 R **6 Claims**



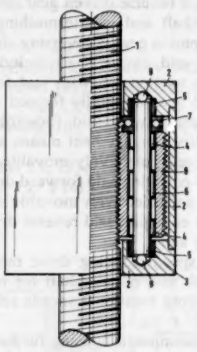
1. A drive transmitting mechanism for converting rotary motion into translatory movement comprising, a screw threaded shaft, an internally threaded hollow sleeve member surrounding said shaft and having opposed flat ends, the threads of said shaft and sleeve having the same pitch whereby they define a helical passage between said sleeve and shaft, a plurality of balls of substantially the same diameter located in said passage, and said passage having opposite ends respectively located adjacent the opposed ends of said sleeve; a single pair of identically shaped one piece molded end plates respectively secured to said opposed ends of said sleeve having a central bore receiving said shaft; and means for transferring said balls between said opposite ends of said helical passage, said means consisting of a longitudinal bore extending through the sleeve parallel to said shaft between said opposed ends of the sleeve and having a diameter greater than that of said balls and said end plates having substantially flat end surfaces facing respectively toward and mating with their associated flat end of the sleeve, each of said flat end surfaces of the end plates facing said sleeve having an arcuate recess formed therein consisting of a counter bore coaxial with and extending radially outwardly over only a part of the periphery of said central bore and a groove opening towards the adjacent flat end face of the sleeve and having an inner end which communicates with and is tangential to said arcuate recess and an opposite outer end which communicates with the end of said sleeve bore in the adjacent end of the the sleeve; said arcuate recess having a radial depth greater than the radius of the balls and an axial width greater than the diameter of the balls; said groove in said end plates having a greater cross section than the cross section of said balls to allow said balls to pass therethrough.

4,074,586

TRAVELING NUT ASSEMBLY WITH LOW FRICTION AND AUTOMATIC BRAKE

Hans Nussbaum, Korker Str. 6, 7641 Bodersweier, Germany

Filed Nov. 29, 1976, Ser. No. 745,785
Int. Cl.² F16H *1/20*
U.S. Cl. 74—424.8 C **11 Claims**



1. A traveling nut assembly carried on a threaded spindle for linear movement therealong in response to rotation of the spindle about its rotational axis, the traveling nut assembly comprising:

a housing through which the spindle extends;

a roller within said housing having a low friction mounting and operatively engaging the spindle;

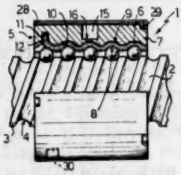
bearing means carried by said housing; and

clutch means responsive to rotation of said roller for selectively effecting frictional engagement between said roller and said bearing means, said clutch means being engaged when the spindle is rotated in one direction so that sliding friction between said roller and said bearing means provides increased resistance to axial movement of the traveling nut on the spindle, said clutch means being disengaged when the spindle is rotated in the other direction so that said roller rotates without substantial resistance.

4,074,587
SCREW-NUT SCREW TRANSMISSION COUPLING

Enzo Brusasco, Turin, Italy, assignor to Roltra S.p.A., Milan, Italy

Filed Aug. 12, 1976, Ser. No. 714,075
Claims priority, application Italy, July 27, 1976, 68870/76
Int. Cl.[2] F16H *1/18, 1/20, 55/22*
U.S. Cl. 74—424.8 R 19 Claims

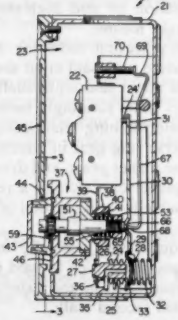


1. A screw-nut screw transmission coupling, comprising an elongate member formed externally with an external helical groove of uniform pitch, a plurality of ball bearings, and a tubular member through which said elongate member extends with radial slack, said tubular member comprising first and second tubular sleeves which are rigidly connected in coaxial arrangement with the first sleeve disposed within the second sleeve, said first sleeve being formed with an internal helical groove of pitch substantially equal to the pitch of said external helical groove, said internal helical groove cooperating with said external helical groove to define a first duct, said second sleeve being formed with a second duct which communicates with said first duct at two points spaced apart therealong by way of at least one hole formed in said first sleeve, said first and second ducts thereby forming an endless rolling duct in which the ball bearings are disposed.

4,074,588
CONTROL UNIT HAVING AN ADJUSTABLE DIFFERENTIAL AND METHOD OF MAKING THE SAME

Edward P. Cumming, Milford, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 456,813, April 1, 1974, Pat. No. 3,952,611.
This application Feb. 18, 1976, Ser. No. 659,168
Int. Cl.[2] G05G *1/04*
U.S. Cl. 74—522 15 Claims

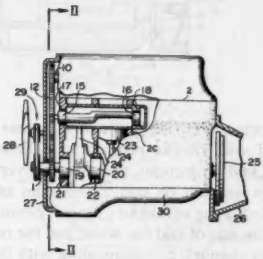


1. In a method of making a control unit having a condition selector means, an actuator and a condition responsive device for actuating said actuator when said condition responsive device senses a condition selected by said selector means, the improvement comprising the steps of disposing a lever in said unit so as to be operatively associated with said actuator and said device whereby said device can actuate said actuator by said lever, forming said selector means with an adjustable part thereof that is engageable with said lever for providing a pivot point for said lever, forming said adjustable part to have an adjustable lost motion with said selector means, and adjusting said adjustable part to adjust said adjustable lost motion thereof and thus the differential in the operation of said actuator by said device.

4,074,589
FOUR CYLINDER IN-LINE ENGINE WITH DRIVING BALANCER SYSTEM

Hirokazu Nakamura, and Hikoichi Motoyama, both of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Sept. 17, 1975, Ser. No. 614,163
Claims priority, application Japan, Oct. 16, 1974, 49-119778
Int. Cl.[2] F16F *15/10*
U.S. Cl. 74—604 2 Claims



1. A cylinder and piston engine, comprising;
a cylinder block;
a crankshaft disposed therein and having cylinder and piston means for rotating it at a crankshaft speed;
a cam shaft for timing intake and exhaust operations in the cylinder means; and
a balancer system for balancing vibromotive forces acting on the cylinder block on operation of the piston means, the system comprising first and second balancer shafts laterally spaced from the crankshaft on two sides of that shaft and substantially parallel thereto, and a timing mechanism disposed at an end of the cylinder block and driven by the crankshaft for driving the balancer shafts and also the cam shaft, the timing mechanism comprising a single elongate endless member engaging the several shafts to drive the first and second balancer shafts in directions opposite to one another, both at a speed equal to twice the crankshaft speed, and
wherein the timing mechanism includes a gear fitted to one of the balancer shafts to drive the shaft, and a gear shaft having idler gear means fitted thereto to be driven thereby and meshing with said gear, said elongate endless member being enabled to drive the gear shaft and the other balancer shaft to effect the rotating of the balancer shafts in opposite directions, and also to drive the cam shaft.

4,074,590
ARRANGEMENT FOR COOLING A LUBRICANT-FILLED, FINNED GEAR CASE BY MEANS OF A BUILT-IN FAN

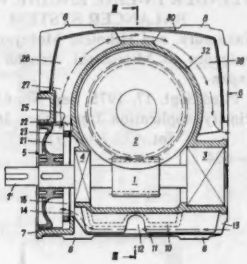
Helmut Jörg, Raffaelgasse 25, 1200 Vienna, Austria

Filed Aug. 5, 1975, Ser. No. 601,999
Claims priority, application Austria, Aug. 7, 1974, 6446/74
Int. Cl.[2] F16H *57/02*
U.S. Cl. 74—606 A 6 Claims

1. A fan-cooled, lubricant filled, gear case unit, comprising:
a stationary gear case of substantially rectangular shape having a top and bottom, opposed ends and opposed sides,

said case containing gearing including a shaft rotatably extending out through one end wall of said gear case;

a single fan wheel connected to said shaft, said one end wall of said gear case including a recess through which said shaft extends, said fan wheel being contained within said recess for rotation with respect thereto, the outer rim of said recess and the outer face of said one end wall being coplanar;



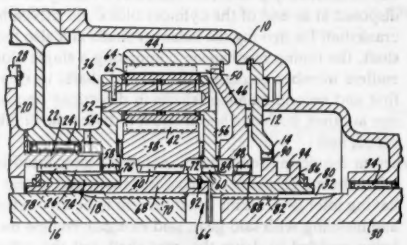
the top, bottom and side walls of said gear case all being provided with rib-like projections defining air channels between said projections, and means covering the outside of said projections on said top, bottom and ends of said case, a first group of said air channels communicating with the suction side of said fan wheel and the remaining group of said air channels communicating with the pressure side of said fan wheel.

4,074,591

COMBINED TORQUE PROPORTIONING AND REDUCTION DRIVE ASSEMBLY

Wesley Marion Dick, Fort Wayne, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 8, 1976, Ser. No. 730,774
Int. Cl.[2] F16H *37/06, 3/44, 57/10*
U.S. Cl. 74—674 **14 Claims**



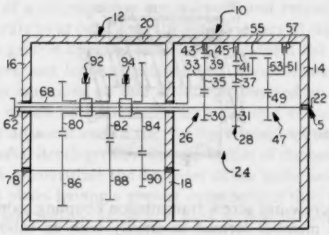
1. A planetary gear assembly comprising first, second, and third rotatable members, a sun gear element, a carrier element, a ring gear element, a plurality of planet gears journaled on said carrier element and in mesh with said sun and ring gear elements, and means for shifting said assembly to first and second operating modes, said means being shiftable to a first operating position engaging said first member with one element, engaging said second and third members with another element, and grounding the remaining element, said means being shiftable to a second operating position engaging fourth element, said shifting means being movable to another position wherein said shaft and carrier are engaged through said first element, said sun gear and first member are engaged through said second element, and said ring gear and second member are engaged through said third element.

4,074,592

DIRECT DRIVE TRANSMISSION WITH HYDRAULICALLY ACTUATED FORWARD AND REVERSE CLUTCHES

W. Gene Stevens, Dunlap, and Willis E. Windish, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 29, 1976, Ser. No. 681,661
Int. Cl.[2] F16H *37/04*
U.S. Cl. 74—740 **5 Claims**



1. A vehicle transmission for an engine driven vehicle comprising:

a housing, including a first wall, a second wall, a mid wall disposed between said first and said second walls, and outer casing means, said first, second, and mid walls extending generally perpendicular to said outer casing means, said outer casing means, said first wall and said second wall for substantially encompassing the transmission;

input shaft means journalled in and extending through said first wall, said mid wall, and said second wall, and including an input shaft, a splined coupling sleeve, and a power take-off shaft, said power take-off shaft coupled to said input shaft by said splined coupling sleeve;

a plurality of planetary gear arrangements including a common planet carrier, a low-range planetary gear arrangement, and a high-range planetary gear arrangement, each of said planetary gear arrangements including a sun gear drivingly associated with said input shaft, a plurality of planet gears rotatingly mounted on said common planet carrier, a ring gear, and brake means selectively actuable for stopping rotation of said ring gear so that said common planet carrier rotates at a predetermined speed relative said input shaft, and wherein actuation of said low-range planetary gear arrangement brake means rotates said common planet carrier at a slower speed relative to said input shaft than actuation of said high-range planetary gear arrangement brake means;

a reverse planetary section including a reverse sun gear drivingly associated with said input shaft, a reverse planet carrier rotatable about said input shaft means, a plurality of reverse planet gears rotatingly mounted on said planet carrier and in intermeshing relationship with said reverse sun gear, a reverse ring gear in intermeshing relationship with said reverse planet gears, and drivingly coupled with said common planet carrier, and a reverse brake means selectively actuable to stop rotation of said reverse planet carrier;

an intermediate quill shaft coaxially mounted about said input shaft means and driven by said planet carrier;

an output shaft journalled in and extending from said mid wall through said second wall;

a low-range speed change means including a low-range drive gear rotatably mounted on said intermediate quill shaft and a low-range driven gear drivingly mounted on said output shaft;

a mid-range speed change means including a mid-range drive gear rotatably mounted on said intermediate quill shaft, and a mid-range driven gear drivingly mounted on said output shaft;

a low-range clutch movable in a first direction to drivingly

engage said low range drive gear with said intermediate quill shaft and movable in a second direction to drivingly engage said mid-range drive gear with said intermediate quill shaft; and

a high-range speed change means including a high-range drive gear rotatably mounted on said intermediate quill shaft, a high-range driven gear drivingly mounted on said output shaft, and high-range drive engagement means selectively operable to drivingly engage said high-range drive gear with said intermediate quill shaft.

4,074,593

MACHINE FOR TREATING CIRCULAR TOOTHED SAWS

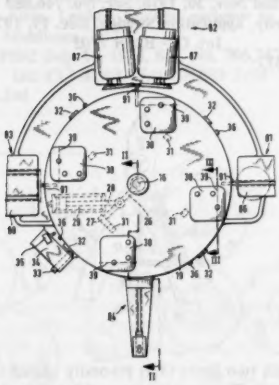
Otto Stier, Biberach, Riss, Germany, assignor to Vollmer Werke Maschinenfabrik GmbH, Germany

Filed Feb. 22, 1977, Ser. No. 770,949

Claims priority, application Germany, Feb. 24, 1976, 2607473

Int. Cl.[2] B23D *63/14;* B24B *5/00*

U.S. Cl. 76—37 **9 Claims**



1. A machine for treating circular toothed saws, comprising:

a stand;

a table rotatably mounted in said stand so as to be rotatable between a preparation station and at least one tooth treating station;

at least two rotatable cotters mounted on said table and spaced angularly by a distance corresponding to the angular distance between said stations;

means for securing a circular saw to said cotter so that said saw is rotatable with said cotter,

feeding means for rotating each saw by at least one tooth spacing;

locking means for releasably locking each cotter in a given position between successive feeds; and

said treating station including means for treating the saw teeth after successive rotations of the saw blade by said cotter.

4,074,594

ROTARY CUTTER FOR AGGLOMERATED FOAM PLASTIC

Arthur G. Dall, and Donald L. Morgan, both of Jasper, Ind., assignors to North American Products Corporation, Atlanta, Ga.

Filed Jan. 21, 1977, Ser. No. 760,946

Int. Cl.[2] B21K *21/00;* B26D *1/12;* B27G *13/00*

U.S. Cl. 76—101 A **5 Claims**

1. The method of making a cutter which is rotatable in one direction for imparting a predetermined profile to a surface on a workpiece, which method comprises:

A. providing a plurality of substantially identical block-like cutting elements of hard metal, each having opposite front and rear end faces, opposite side faces, and opposite top and bottom faces;

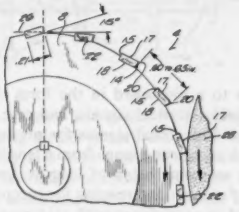
B. forming a body having an axis and having an axially extending surface which is substantially circular and concentric to said axis on every plane normal thereto;

C. delineating on said surface of said body marks which define the intersections with said surface of a series of planes which are normal to said axis and are spaced apart by uniform distances slightly less than the width of a cutting element as measured between its side faces;

D. forming axially extending shallow grooves in said body that open to its said surface and are substantially V-shaped in cross-section, each of said grooves having

(1) one surface which faces in said direction of rotation and lies substantially on a radial plane that also contains said axis,

(2) the other surface of each groove being substantially normal to said one groove surface, said grooves being arranged at uniform circumferential intervals around the body;



E. by reference to said marks, bonding said cutting elements to the body in said grooves,

(1) with each cutting element having its rear face substantially flatwise engaging said one surface of a groove, and

(2) its bottom face flatwise overlying said other surface of the same groove, and

(3) with all of said cutting elements in a consistent relationship to the planes defined by said marks such that every cutting element is in axially offset relationship to at least one circumferentially adjacent cutting element and has its kerf in slightly overlapping relationship to the kerf of said circumferentially adjacent cutting element; and

F. with the body confined to rotation about its axis, grinding the top faces of cutting elements adjacent to their front faces, to define cutting edges on the several cutting elements and to cause each set of said cutting edges that extend across a common plane normal to said axis to be spaced at a substantially uniform distance from said axis.

4,074,595

MEANS FOR PRODUCING DIE BOARD AND CUTTING RULES FOR SAME

Louis E. Sauer, and Orville C. Miller, both of St. Louis, Mo., assignors to Centenary Central, Inc., St. Louis, Mo.

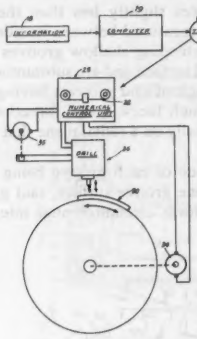
Division of Ser. No. 318,220, Dec. 26, 1972, which is a continuation-in-part of Ser. No. 184,248, Sept. 27, 1971, abandoned, which is a division of Ser. No. 840,384, July 9, 1969, Pat. No. 3,696,480. This application June 21, 1974, Ser. No. 481,773

Int. Cl.[2] B21K *5/20*

U.S. Cl. 76—107 C **6 Claims**

1. A system for automatically producing a die board having spaced holes therein defining a preselected design and adapted to receive tangs of die rule segments, and for automatic production of die rule segments of a design having depending tangs wherein said segments are adapted for reception in said spaced holes, said system comprising means for developing

data defining said preselected die board design and defining said die rule design for reception in said die board of said preselected design, which data are adapted to be stored, apparatus for storing said developed data, means for receiving said stored data for producing electrical signals in response thereto corresponding to said die board and rule designs, work forming means adapted to physically apply said preselected die



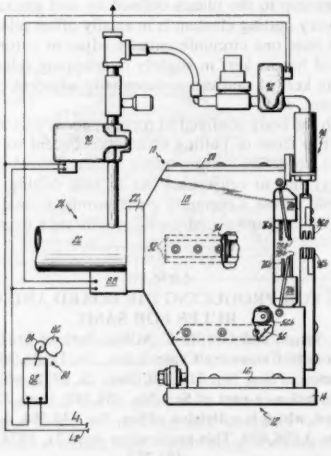
board design to a die board in the form of spaced holes in response to said electrical signals, and rule cutting means responsive to said electrical signals for producing said die rule segments with supporting tangs from a length of die rule blank, said die rule segments being of lengths, and said supporting tangs being of number and spacing for reception in the holes of said die board in accordance with said preselected design.

4,074,596

WIRE STRIPPING APPARATUS

Merle C. Mihulka, Boyne City, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Jan. 27, 1977, Ser. No. 762,913
Int. Cl.[2] H02G *1/12*
U.S. Cl. 81—9.51 **3 Claims**



1. A device for stripping insulation from the end of an insulated wire, comprising:

a housing assembly;

an inner housing slidably mounted for reciprocable movement with respect to said housing assembly, said inner housing being movable between actuated and retracted positions;

a pair of cutting blades;

means for slidably mounting said cutting blades for reciprocable movement on said inner housing;

ram means for providing a linear movement between actuated and deactuated positions;

motion conversion means for converting the linear movement of said ram means into linear movement of said cutting blades in a direction radial to the axis defined by the linear movement of said ram means;

stop means for arresting movement of said motion conversion means at a predetermined point in the operating cycle of said device; and

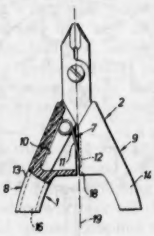
said ram means and said stop means being effective to initiate movement of said inner housing toward the retracted position after said movement of said motion conversion means has been arrested.

4,074,597

PLIERS

Conny Erik Jansson, Enkoping, Sweden, assignor to AB Bahco Verktyg, Enkoping, Sweden

Filed Nov. 30, 1976, Ser. No. 746,080
Claims priority, application Sweden, Dec. 19, 1975, 7514465
Int. Cl.[2] B25B *7/02*
U.S. Cl. 81—417 **3 Claims**



1. Pliers with two limbs (1,2) pivotally united in a joint (3) and with a spring (7) which is arranged between them to move the handles (8,9) of the limbs apart, and has an end part (10) attached in a recess (15) in the handle (8) of one limb (1), and a free end part (11) which, when the handles (8,9) are moved towards each other against the spring bias, engages glidingly in an open trough-shaped guiding track (12) facing the first limb (1), on the handle (9) of the other limb (2), and is so orientated that its place of engagement against the guiding track (12), during the movement of the handles (8,9) towards each other, is moved in a direction away from the joint (3) of the pliers, characterized in that the recess (15) and the guiding track (12) are situated in handle sleeves (13,14) arranged on respective limbs (1,2), the handle sleeve (14) provided with the guiding track (12) having a projection (18) facing towards the opposing handle sleeve (13), the guiding track (12) extending along the face of the projection turned towards the handle sleeve (13).

4,074,598

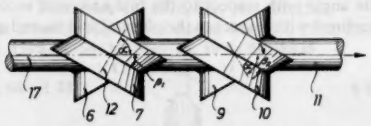
INFEED DEVICE FOR A TURNING MACHINE FOR FINISHING THE PERIPHERAL SURFACES OF ELONGATED WORKPIECES OF CYLINDRICAL CROSS-SECTION

Karl-Gustav Weck, Solingen, Germany, assignor to Kieserling & Albrecht Werkzeugmaschinenfabrik, Solingen, Germany

Filed July 9, 1976, Ser. No. 703,937
Claims priority, application Germany, July 12, 1975, 2531320
Int. Cl.[2] B23B *5/00*
U.S. Cl. 82—20 **4 Claims**

1. In a turning machine with a cutter head for finishing the peripheral surface of elongated workpieces of circular cross-section, such as rods, wires and tubes, movable in longitudinal direction through the machine while the cutter head revolves in a predetermined direction about the axis of a workpiece, an

infeed device comprising at least one pair of inlet rolls, each having a peripheral surface of V-shaped cross-section and a plane of symmetry normal to the axis thereof, the plane of symmetry of each roll of a pair including with the direction of



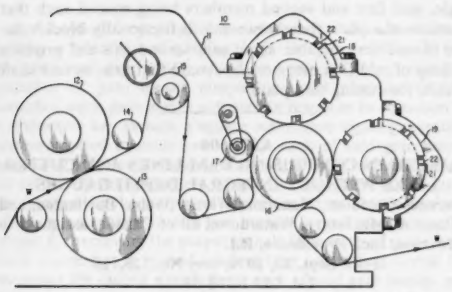
movement of the workpiece through the machine, an angle which is greater than zero and smaller than 10°, with the planes of symmetry of the rolls in said at least one pair of rolls inclined in opposite directions with respect to the direction of movement of the workpiece.

4,074,599

PAPER WEB PERFORATING MACHINE

Frederick G. Allen, Loxbro, Canada, assignor to Wood Industries, Inc., Middlesex, N.J.

Filed July 14, 1976, Ser. No. 705,247
Int. Cl.[2] B23D *25/12*; B26D *1/56*
U.S. Cl. 83—346 **13 Claims**



1. A high speed paper web cutting machine having at least one cutting cylinder, said perforating cylinder having at least one groove spaced axially extending over the length thereof, a knife blade means having radially extending cutting edges adjustably clamped in said groove, said machine comprising an anvil cylinder adapted for carrying a paper web, said anvil cylinder having a smooth, hardened surface, said cutting cylinder disposed to operate in close relationship with said anvil cylinder, and said knife blade means being adjusted in such manner, as to have their cutting edges able to cut a paper web, touching said surface of said anvil cylinder said anvil cylinder formed from a hollow sleeve member having end cap members permanently fixed thereto; each of said end cap members having a substantially solid portion on one end thereof and a conical shaped cavity on the other end thereof such that the moment of enertia of the anvil cylinder is significantly altered from that of a solid member and such that resonant frequency of the anvil cylinder in a radial direction is altered.

4,074,600

ROTATION APPARATUS FOR WORK PIECES

Rouchdy B. Raphael, 319 Lyon NE., Grand Rapids, Mich. 49503

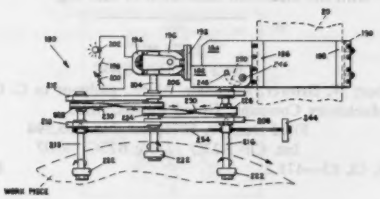
Division of Ser. No. 562,592, March 27, 1975, Pat. No. 3,995,521. This application May 12, 1976, Ser. No. 685,623
Int. Cl.[2] B26D *7/06*
U.S. Cl. 83—411 R **12 Claims**

1. Apparatus for positioning the center of a circular arc to be cut in a work piece with a band saw or other cutting tool or apparatus, the tool or apparatus being of the type including a work support table and a cutting means positioned to cut through a work piece supported by the work support table, said apparatus comprising:

base means for engaging the work table of the cutting tool or apparatus and supporting a work piece to be cut, said base means having a first end adapted to fit adjacent the cutting means, a second end remote from the cutting means,

an arm extending toward the cutting means and support means mounted at a fixed position on said second end of said base for supporting said arm in cantilivered fashion spaced above said base and the work piece and for positioning said arm laterally generally at a right angle to the plane of said blade;

center point determining means on said arm for positioning the center point of the arc of the work piece to be cut



against said base means and means for moving said center point determining means toward and away from the cutting means along and over said base means to determine the length of the radius of the arc to be cut in the work piece whereby when the center point of the arc to be cut on the work piece is so positioned, the work piece can be rotated about the center point to cut an extremely accurate, precise circular arc in the work piece;

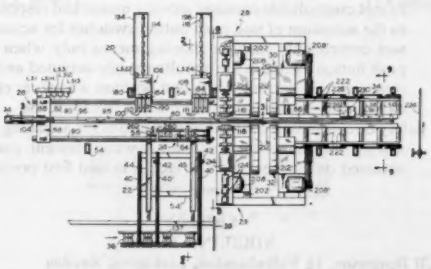
rotation means for rotating a work piece to cut an arc therein including at least a pair of generally opposing wheels for engaging opposite surfaces of a work piece; means for rotating said wheels and thus the work piece including motive power means for simultaneously driving said wheels.

4,074,601

AUTOMATIC SAWMILL

Lyle D. Warren, 500 Birch St., Sweet Home, Oreg. 97386, and Robert W. Brewster, 5924 SE. McNary Road, Milwaukee, Oreg. 97222

Division of Ser. No. 434,903, Jan. 21, 1974, Pat. No. 3,960,041, which is a division of Ser. No. 190,589, Oct. 19, 1971, Pat. No. 3,811,487. This application Dec. 29, 1975, Ser. No. 644,571
Int. Cl.[2] B27B *15/08*
U.S. Cl. 83—425.2 **17 Claims**



1. Sawmill apparatus comprising:

cutting means, and carriage means for receiving a log and propelling the same substantially longitudinally with respect to said cutting means,

backstand means movable in a direction normal to said

carriage means to provide for positioning of said log relative to said carriage means,

charger means for moving a log substantially in the direction of said backstand means to a position where the log is substantially aligned with a position determined by said backstand means,

said carriage means having log engaging means associated therewith for engaging said log in the aligned position thereof so that said carriage means can propel said log substantially longitudinally with respect to the cutting means,

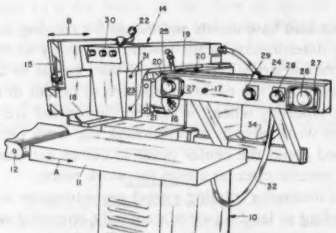
and means for measuring said log and in response thereto moving said backstand means to a position relative to the cutting means for making predetermined cuts in said log positioned relative to the side of said log in accordance with the measured dimension of said log.

4,074,602

DEFECTING SAW

Robert W. Brower, Allendale, Mich., assignor to C. O. Porter Machinery Company, Grand Rapids, Mich.

Filed Dec. 30, 1976, Ser. No. 755,594
Int. Cl.² B23Q *11/06*; B27G *19/02*
U.S. Cl. 83—471.2 **13 Claims**



1. A saw comprising:

a carriage and controllable means for moving said carriage between a first retracted position and a second extended position;

a sawing element mounted on said carriage and means for actuating said sawing element;

a pair of spaced operator actuated push button switches for cycling said sawing element and carriage between said first and second positions;

a control circuit including a timing circuit coupled to said pair of push button switches, said control circuit coupled to said controllable carriage moving means and responsive to the actuation of said push button switches for actuating said controllable carriage moving means only when said push button switches are simultaneously actuated and for returning said carriage to its first position whenever either one of said push button switches are released; and

safety circuit means coupled to said means for actuating said sawing element such that said sawing element can be actuated only when said carriage is in said first position.

4,074,603

NIBBLING TOOL

Ulf Bengtsson, 11 Valhallagatan, Linkoping, Sweden

Filed July 12, 1976, Ser. No. 704,692
Claims priority, application Sweden, July 15, 1975, 7508079
Int. Cl.² B23D *27/00*
U.S. Cl. 83—596 **9 Claims**

1. A nibbling tool for contour cutting and forming holes in a plate, said tool comprising first and second opposed members between which a plate is inserted for being cut, each one of said members having a cutting edge each said edge lying in their respective plane; a shaft rotatable about a first longitudinal axis, means rotatably supporting said first member from said shaft for rotation about a second axis which is inclined at an acute angle with respect to the first axis, said second axis being inclined with respect to the plane of said second member

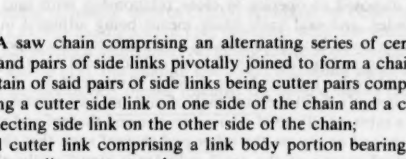
such that the cutter plane of the first member is inclined with respect to the cutter plane of the second member at said acute angle, said first and second members being spaced such that insertion of a plate therebetween will frictionally block rotation of said first member about said second axis and produce rocking of said first member about said first axis, as said shaft rotates, for cutting said plate.

4,074,604

SAW CHAIN COMPRISING CAM LINKS AND CUTTER LINKS WITHOUT INTEGRAL DEPTH GAUGES

Lawrence Goldblatt, Hamilton; Werner Weiss, Burlington, and Peter A. MacIntyre, Waterdown, all of Canada, assignors to Textron, Inc., Providence, R.I.

Filed Sept. 23, 1976, Ser. No. 725,710
Int. Cl.² B27B *33/14*
U.S. Cl. 83—830 **19 Claims**



1. A saw chain comprising an alternating series of center links and pairs of side links pivotally joined to form a chain;

certain of said pairs of side links being cutter pairs comprising a cutter side link on one side of the chain and a connecting side link on the other side of the chain;

said cutter link comprising a link body portion bearing an upstanding cutter tooth;

each said cutter link of said chain being formed without an integral depth gauge thereon;

the pair of side links next preceding each cutter pair being a cam pair comprising a connecting side link on the same side of the chain as the following cutter link and a cam link on the opposite side of the chain from the following cutter link;

said cam link comprising a link body portion bearing an upstanding cam portion having an upwardly and rearwardly inclined forward edge and a rearwardly projecting tail;

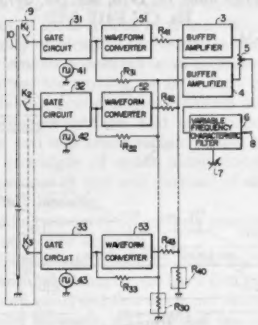
the maximum height of said center links and of said connecting side links being substantially less than the height of the cam portion of said cam link.

4,074,605

KEYBOARD OPERATED ELECTRONIC MUSICAL INSTRUMENT

Junnosuke Shigeta, and Tomiji Munehiro, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 11, 1976, Ser. No. 685,136
Claims priority, application Japan, May 16, 1975, 50-58811; May 16, 1975, 50-58834; May 16, 1975, 50-58835
Int. Cl.[2] G10H *1/00, 5/02*
U.S. Cl. 84—1.22 6 Claims



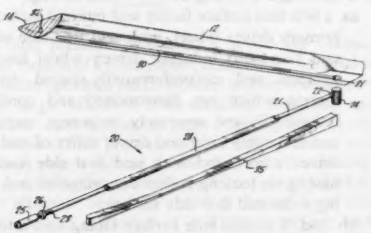
1. A keyboard operated electronic musical instrument comprising a plurality of playing keys and a plurality of key switches each playing key actuating a respective key switch, a plurality of gate means coupled to said plurality of key switches, each gate means actuated in response to actuation of a respective key switch, a square wave tone signal generating source applied to each gate means, each of said gate means providing a square wave output signal when actuated, a plurality of waveform converters coupled to respective gate means for converting the output of said gate means to a waveform other than a square wave, a first musical tone signal processing circuit for receiving the output signals from each of said waveform converters, a second musical tone processing circuit for receiving the output signals from each of said gate means, and means for variably mixing the output signals from said first and second tone signal processing circuits and for providing said mixed output signals as a musical tone output.

4,074,606

MUSICAL INSTRUMENT TRUSS ROD ASSEMBLY

C. Leo Fender, 2851 Rolling Hills Drive, SP. 33, Fullerton, Calif. 92635

Filed Oct. 20, 1976, Ser. No. 734,286
Int. Cl.[2] G10D *3/00*
U.S. Cl. 84—293 4 Claims



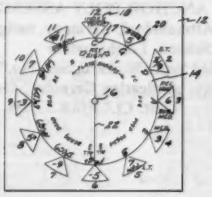
1. In a musical instrument of the type including a neck having a slot in one side thereof for receipt of a truss rod assembly, said truss rod assembly including an elongate, curved truss rod, a fixed anchor nut at one end of said truss rod, and a washer and tension nut at the other end of said truss rod, rotation of said tension nut increasing or decreasing the tension on said truss rod to adjust the curvature of said instrument neck, the improvement wherein a major portion of said truss rod, between said anchor nut and said washer, is flat in a plane perpendicular to the plane of curvature of said truss rod to increase the flexibility of said truss rod.

4,074,607

MUSIC MAGIC CIRCULAR CALCULATOR

Charles Stephen Bond, 2625 Whites Point Drive, San Pedro, Calif. 90732

Filed Aug. 26, 1974, Ser. No. 500,386
Int. Cl.[2] G09B *15/02*
U.S. Cl. 84—471 SR 13 Claims



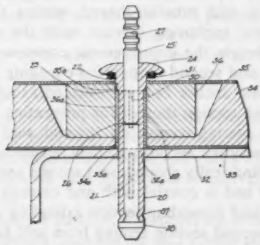
1. A device of the slide rule type useful in music analysis which comprises:
(1) a base plate member;
(2) a circular disk member mounted thereon;
(3) a first series of 12 indicia, representative of the 12 notes of an octave of the musical scale disposed on one of said members in a circle of fifths progression;
(4) a second series of 12 indicia cooperative with the first series of indicia, including note identifying indicia; and
(5) an index and a plurality of 11 calibration marks in circular progression therefrom on the other of said members including a common identifying color at the index mark and representative of the root note, at the fourth calibration mark and representative of the second note, and at the first calibration mark and representative of the third note of a major triad musical chord, and a lighter shade of said identifying color at the tenth calibration mark to identify the fourth note of a dominant seventh card.

4,074,608

BLIND SPACER FASTENER

George Siebol, Orange, Calif., assignor to Armco Steel Corporation, Middletown, Ohio

Continuation of Ser. No. 632,498, Nov. 17, 1975, abandoned.
This application May 13, 1977, Ser. No. 796,538
Int. Cl.[2] F16B *13/06*
U.S. Cl. 85—71 11 Claims



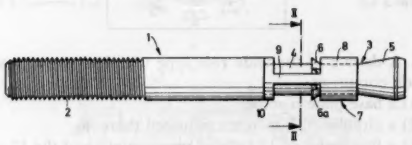
1. A spacer fastener for effectively joining a first member to a second member with a controlled space therebetween which comprises: a main rivet sleeve having an enlarged sleeve head

thereon to engage the outside of said first member and a free end removed from said sleeve head; rivet pin having a shank with a constant diameter portion within said main rivet sleeve and having a pin head thereon engaging said sleeve free end said rivet pin shank including a pull portion with gripping means thereon extending beyond said sleeve head, said main rivet sleeve having a bore throughout its length which is substantially equal in diameter to the maximum diameter of said rivet pin shank throughout the extent thereof so as to initially just nicely receive a major portion of said constant diameter pin portion and axially spaced external means for picking up the underside of said first member and the outside of said second member respectively, as said pin head is drawn against said sleeve free end towards said sleeve head.

4,074,609
ANCHOR BOLT ASSEMBLY

Albert Busler, Altmuhldorf, Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Sept. 30, 1976, Ser. No. 728,160
Claims priority, application Germany, Oct. 1, 1975, 2543912
Int. Cl.[2] F16B *13/06*
U.S. Cl. 85—77 **11 Claims**

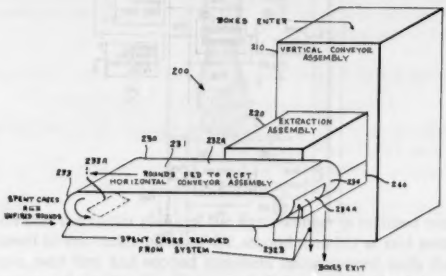


1. An anchor bolt assembly for insertion into a borehole formed in a support structure such as for use in securing a part to the support structure, comprising an axially elongated anchor bolt and an expanding member mounted on said anchor bolt, said anchor bolt having a forward end to be inserted first into the borehole and a rearward end, said anchor bolt having a first axially extending section extending from the rearward end toward and spaced from the forward end thereof, a second axially extending section located intermediate the forward end of said anchor bolt and the end of said first section closer to the forward end of said anchor bolt, said second section having a smaller diameter than said first section, an axially extending expanding section located between the forward end of said anchor bolt and the end of said second section closer to the forward end of said anchor bolt, said expanding member having a tubular shaped section laterally enclosing at least an axially extending portion of said second section and located between said first section and said expanding section, said expanding section having side surfaces arranged to displace the tubular shaped section of said expanding member radially outwardly, means associated with said first section for displacing said anchor bolt in the axial direction extending from the forward end toward the rearward end of said anchor bolt for displacing said expanding section into said expanding member for expanding said tubular shaped section thereof radially outwardly into anchoring contact with the surfaces of the borehole, wherein the improvement comprises a stop means mounted on said second section for engaging said expanding member as said anchor bolt is displaced axially through said tubular shaped section thereof for preventing said expanding section from passing completely through said tubular shaped section whereby the anchoring effect would be lost, said first section is cylindrically shaped, said second section is cylindrically shaped and is coaxial with and extends from said first section, and said expanding section extending axially from the end of said second section remote from said first section, said expanding section being frusto-conically shaped with the smaller diameter end thereof located at the junction with said second section, said expanding member comprises a pair of oppositely arranged shell sections forming said tubular section, said expanding member includes a ring shaped retaining member spaced axially from said shell sections in a direction toward the rearward end of said anchor bolt, and axially extending connecting members connected to and extending between said shell sections and said retaining member.

4,074,610
AUTOMATED AMMUNITION LOADING/DOWNLOADING SYSTEM

William E. Lock, 183 Wygant Road, Horseheads, N.Y. 14845, and Charles J. Churillo, 221 Gilda Place, Fort Walton Beach, Fla. 32548

Filed June 18, 1976, Ser. No. 697,662
Int. Cl.[2] F41F *9/02*
U.S. Cl. 89—34 **6 Claims**



1. An automated system for loading and downloading a plurality of identical items from a plurality of identical containers housing said identical items, wherein said system is adapted for use in loading and downloading identical rounds of ammunition from identical standardized containers to an aircraft that is structured and powered by another system to receive and to use live rounds of said ammunition and to reject cartridge cases of spent rounds of said ammunition, comprising:

a. a loader assembly which includes conveyor elements and comprises:

1. a vertical conveyor assembly, which includes an interrupted intermittent motion device, comprising:

a. a rotatable input drive shaft;

b. a primary driver wheel disposed on said input drive shaft, with said primary driver wheel having an internal surface, a locking groove in said internal surface, and a driver roller connected to and protruding from said internal surface:

c. a secondary driver wheel disposed on said input drive shaft, with said secondary driver wheel having an internal surface facing said internal surface of said primary driver wheel, a locking groove in said internal surface, and a driver roller connected to and protruding from said internal surface;

d. a two-sided indexing driven wheel having:

aa. a first side surface facing said internal surface of said primary driver wheel, with said first side surface of said two-sided indexing driven wheel having four adjacent and circumferentially-spaced drive slots therein which are dimensioned and configurated, individually and separately, to accept, engage with, and releasably hold said driver roller of said primary driver wheel, and with said first side surface also having six locking rollers connected to and protruding from said first side surface;

bb. and, a second side surface facing said internal surface of said secondary driver wheel, with said second side surface of said two-sided indexing driven wheel having one drive slot therein dimensioned and configurated to accept, engage with, and releasably hold said driver roller of said secondary driver wheel, and with said second side surface also having two locking

rollers connected to and protruding from said second side surface;

e. and, a rotatable output shaft on which is disposed said two-sided indexing driven wheel;

2. an extraction assembly operatively associated with said vertical conveyor assembly;

3. a horizontal conveyor assembly operatively associated with said extraction assembly, wherein said horizontal conveyor assembly comprises:

aa. a housing having a flat table-like upper surface, a lower surface, and two end portions, with each said end portion having an opening configurated and dimensioned to accept and permit the passage therethrough of said cartridges of spent rounds of ammunition;

bb. a plurality of identical individual ammunition round-carrier elements connected in an endless chain fashion;

cc. and, means for moving, in an endless chain manner, said individual round-carrier elements across said flat table-like upper surface, said end portions, said end openings, and said lower surface of said housing;

whereby said cartridges of spent ammunition rounds fall through said openings in said end portions of said horizontal conveyor assembly housing;

4. and, a reloading assembly operatively associated with said horizontal conveyor assembly;

b. means for housing said conveyor elements, wherein said conveyor elements housing means has a first open end and a second open end, with said first open end in communication with said loader assembly, and wherein said conveyor elements housing means includes flexible chuting having a first open end and a second open end;

c. and, a loader assembly/aircraft interface unit in communication with said open end of said conveyor elements housing means, and also simultaneously in communication with the other system in the aircraft.

4,074,611

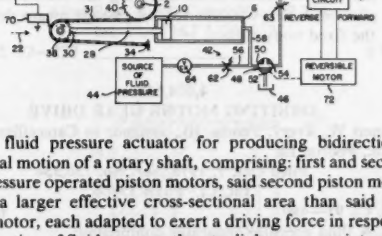
FLUID PRESSURE ACTUATOR FOR PRODUCING ROTATIONAL MOTION

Ralph F. Hereth, 3608 Clover Valley Road, Port Orchard, Wash. 98366

Continuation-in-part of Ser. No. 500,447, Aug. 26, 1974, abandoned. This application Mar. 3, 1976, Ser. No. 663,569

Int. Cl.[2] F01B *9/00;* **F01L** *25/08, 33/04*

U.S. Cl. 91—179 **12 Claims**



1. A fluid pressure actuator for producing bidirectional rotational motion of a rotary shaft, comprising: first and second fluid pressure operated piston motors, said second piston motor having a larger effective cross-sectional area than said first piston motor, each adapted to exert a driving force in response to application of fluid pressure thereto; linkage means interconnecting said piston motors to the shaft for transmitting their respective driving forces to the shaft in opposed relation, so as to cause alternate reversing rotation thereof upon alternate advancement and retraction of said piston motors; and fluid pressure control means including a fluid pressure source arranged to supply constant fluid pressure to said first piston motor, a fluid pressure return, and a single control valve connected with said fluid pressure source, said fluid pressure return and said first and second piston motors and including means for (1) maintaining fluid pressure on said first piston motor composed solely of fluid from said fluid pressure source while exhausting fluid from said second piston motor to said fluid return, thereby causing said rotary shaft to rotate in a first direction, and for (2) connecting said second piston motor to said source of fluid pressure and said first piston motor while blocking both said piston motors from said fluid pressure return, thereby causing said rotary shaft to rotate in a second direction opposite said first direction.

4,074,612

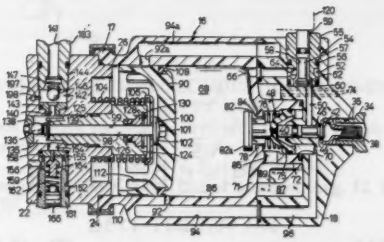
FLUID OPERATED HYDRAULIC PUMP

Douglas P. Miller, Milwaukee, Wis., assignor to Applied Power Inc., Milwaukee, Wis.

Filed Aug. 25, 1976, Ser. No. 717,748

Int. Cl.[2] F01L *25/04, 23/00*

U.S. Cl. 91—290 **6 Claims**



1. A fluid driven motor comprising:

a motor body having a motor chamber formed therein, said motor chamber having an end wall, an inlet passage in communication between said motor chamber and a fluid source, and an exhaust passage in communication between said motor chamber and a point of pressure relief;

a motor piston reciprocable within said chamber for an intake stroke away from said end wall and an exhaust stroke toward said end wall;

a bore in said end wall and including an inlet port for said inlet passage and an exhaust port for said exhaust passage;

a reciprocably movable shuttle valve poppet including a piston portion in said bore and an exhaust port seal;

said exhaust port seal being located in said motor chamber for cooperating with said exhaust port for preventing fluid flow through said exhaust passage during said intake stroke of said motor piston and for permitting fluid flow through said exhaust passage during said exhaust stroke, said exhaust port seal being engagable by said motor piston when the latter nears the end of its exhaust stroke;

a reciprocable check valve poppet in said bore cooperating with said inlet port for preventing fluid flow through said inlet passage during said exhaust stroke of said motor piston and for permitting fluid flow through said inlet passage during said intake stroke;

means for connecting said shuttle valve poppet to said check valve poppet whereby movement of said exhaust port seal to open or close said exhaust port is accompanied by movement of said check valve poppet to close or open said inlet port, respectively;

biasing means in said bore for continuously acting on said shuttle valve poppet to releasably maintain said exhaust port seal in closed position and said check valve poppet in open position as said motor piston moves through its intake stroke;

means, including a passage, for supplying pressurized fluid from said motor chamber to said piston portion of said bore when said motor piston is near the end of its intake stroke for moving said shuttle valve poppet against the action of said biasing means to thereby move said exhaust port seal to open position and to move said check valve poppet to closed position;

said exhaust port seal being movable to closed position and said check valve poppet to open position by engagement of said motor piston with said exhaust port seal when said motor piston is near the end of its exhaust stroke; and

a throttle valve in said inlet passage for controlling fluid flow through said inlet passage.

4,074,613

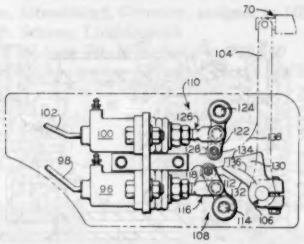
VARIABLY BIASED CONTROL MECHANISM

John R. Muntjanoff, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 543,579, Jan. 23, 1975, Pat. No. 3,990,552. This application July 21, 1976, Ser. No. 707,161

Int. Cl.[2] F15B *11/16, 13/06*

U.S. Cl. 91—413 **4 Claims**



1. A control mechanism for power train including first and second hydraulically operable motor means, and a source of fluid under pressure, the control mechanism comprising:

a control valve for selectively communicating the source of fluid under pressure with the first and second motor means;

control lever means for operating the control valve, the control lever means including a control lever and a common control element, the control lever movable in a first direction to actuate the first motor means, and the control lever movable in a second direction to hydraulically actuate the second motor means;

manually operable means for positioning the control lever;

first biasing lever means operably interconnected between said manually operable means and said common control element and cooperating with said common control element for moving said control lever in said first direction of travel at a relatively low rate of modulation; and

second biasing lever means operably interconnected between said manually operable means and said common control element and cooperating with said common control lever in said second direction of travel at a relatively high rate of modulation.

4,074,614

VALVING FOR DUAL RADIAL PISTON MOTOR

Charles E. Beals, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 7, 1976, Ser. No. 730,491

Int. Cl.[2] F01B *13/06*

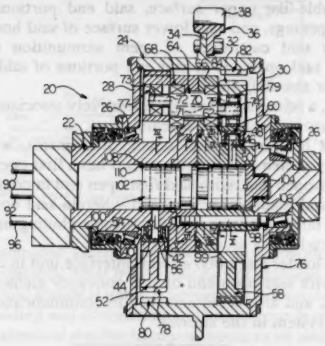
U.S. Cl. 91—490 **12 Claims**

1. A fluid transfer apparatus comprising:

fixed body means defining a bore and defining first passage means communicating with said bore and through which fluid may flow into the bore, and second passage means communicating with the bore and through which fluid may flow from the bore;

a plurality of piston and cylinder means reciprocably associated with the fixed body means;

a valving element rotatable within said bore defined by the fixed body means and defining means such that as the valving element is rotated relative to the fixed body means, communication is provided between each piston and cylinder means, and the first and second passage means of the fixed body means alternately, to alternately direct fluid to and allow flow of fluid from each piston and cylinder means, wherein the means defined by the valving element comprising (i) first channel means defined thereabout and communicating with the first passage means defined by the fixed body means (ii) second channel means disposed about a portion of the valving element and communicating with some of said piston and cylinder means, (iii) internal passage means communicating the first and second channel means, wherein the means defined by the valving element further comprise (iv) third channel means disposed thereabout and communicating with the second passage means defined by the fixed body means, (v) fourth channel means disposed about a portion of the valving element and communicating with the other piston and



cylinder means, and (vi) internal passage means communicating the third and fourth channel means; and

means for generally balancing lateral forces applied to the valving element by fluid pressure applied thereto and released therefrom through the second and fourth channel means, wherein the means for generally balancing lateral forces comprise first additional channel means disposed about a portion of the valving element on a side thereof generally opposite the second channel means, and means communicating fluid pressure to said first additional channel means from said first passage means defined by the first body means, and second additional channel means defined by and disposed about a portion of the valving element on a side thereof generally opposite the fourth channel means, and means communicating the second additional channel means with the second passage means defined by the fixed body means.

4,074,615

ORBITING MOTOR GEAR DRIVE

Bennett W. Avery, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 7, 1976, Ser. No. 730,554

Int. Cl.[2] F01B *13/06*

U.S. Cl. 91—490 **14 Claims**

1. A fluid pressure apparatus comprising:

fixed body means;

a first orbiting member disposed about said fixed body means, defining a plurality of outwardly-projecting teeth;

a second orbiting member disposed about said fixed body means, defining a plurality of outwardly-projecting teeth equal in number to the teeth defined by the first member;

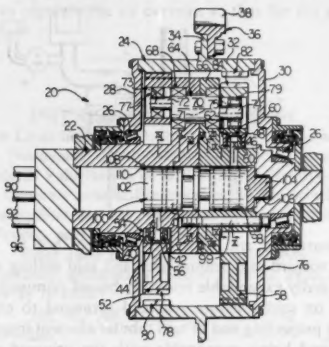
means movably mounting the first and second orbiting members relative to the fixed body means for determining orbiting movement of the first and second orbiting members relative to the fixed body means;

a first plurality of piston and cylinder means operatively

interconnecting the fixed body means and first orbiting member;

a second plurality of piston and cylinder means operatively interconnecting the fixed body means and second orbiting member;

rotary body means defining a first plurality of inwardly-projecting teeth of a number greater than the number of teeth defined by the first orbiting member, the teeth of the orbiting member being adaptable for engagement with the first plurality of teeth of the rotary body means, and defining a second plurality of inwardly-projecting teeth of a number equal to the number of the first plurality of inwardly-projecting teeth defined by the rotary body



means, the teeth of the second orbiting member being adaptable for engagement with the second plurality of teeth of the rotary body means, and

wherein the means movably mounting the first and second orbiting members relative to the fixed body means comprise a plurality of crankshafts, each defining a main body portion rotatably mounted to the fixed body means, a first extending portion spaced from the axis of rotation of the main body portion and to which the first orbiting member is rotatably mounted, and a second extending portion spaced from the axis of rotation of the main body portion and to which the second orbiting member is rotatably mounted.

4,074,616

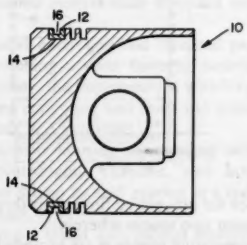
ALUMINUM PISTON WITH STEEL REINFORCED PISTON RING GROOVES

Preston Lee Gale, East Peoria, and Jack E. Fair, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 2, 1975, Ser. No. 609,264

Int. Cl.[2] F16J *1/00, 9/22*

U.S. Cl. 92—222 **1 Claim**



1. A piston comprising a body of aluminum or aluminum alloy which is at least about 88% pure aluminum having a cylindrical outer surface and a unitary insert ring made of austenitic stainless steel, said insert ring being embedded in said body about said cylindrical outer surface of said body spaced from the ends thereof and coaxial therewith, said insert ring having an outer surface with a diameter about equal to the outer diameter of said cylindrical outer surface of said body and an inner surface with a diameter substantially less than said outer diameter thereof, said inner and outer surfaces of said insert ring being joined by side surfaces with the material of said insert ring alloyed with the aluminum of said body to provide a diffusion zone at least about 0.009 inch thick throughout the interface between said body and the inner and side surfaces of said insert ring, and a circumferential groove formed in said outer surface of said insert ring.

4,074,617

PISTONS FOR INTERNAL COMBUSTION ENGINES OR FOR COMPRESSORS

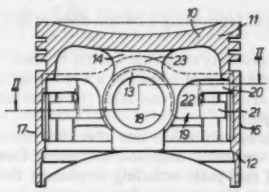
Frederick Edward Cockcroft, Bradford, England, assignor to Hepworth & Grandage Ltd., England

Filed July 16, 1976, Ser. No. 705,787

Claims priority, application United Kingdom, Aug. 12, 1975, 33464/75

Int. Cl.[2] F16J *1/04, 1/06*

U.S. Cl. 92—228 **4 Claims**



1. A light metal piston for an internal combustion engine or a compressor, having a crown, a skirt integrally connected to said crown in a manner to provide an internal cavity in the piston, and affording opposite thrust faces, gudgeon pin bosses having bores opening into said cavity, and two expansion control inserts made of a material of lower coefficient of thermal expansion than the light metal, each insert conforming to the internal shape of the piston skirt, each said insert having

a pair of connecting portions each anchored in a gudgeon pin boss;

a further portion interconnecting said pair of connecting portions;

a pair of elongated first bands, having the inner face thereof open to said cavity, each extending from a said connecting portion part way only round one of said thrust faces to form a bi-metallic element therewith, each said first band being near the crown end of said skirt;

a pair of elongated second bands, having the inner face thereof entirely open to said cavity, each extending from a said connecting portion, being spaced apart from and substantially parallel with and independent from said first bands, each said second band extending part way only round one of said thrust faces to form a bi-metallic element therewith, each said second band being nearer the open end of said skirt than each said first band; said first bands being substantially longer than said second bands,

whereby said first bands exert a greater degree of thermal expansion control for a given temperature change than do said second bands.

4,074,618

PROCESS AND APPARATUS FOR GLUEING CARTON BODIES

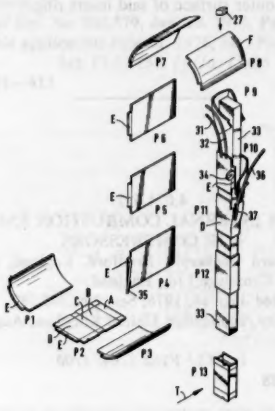
Luigi Gennari, Cremona, Italy, assignor to Kartocol Anstalt, Vaduz, Liechtenstein

Filed Feb. 24, 1976, Ser. No. 661,039

Claims priority, application Switzerland, Mar. 4, 1975, 2821/75

Int. Cl.[2] B31B *1/26*

U.S. Cl. 93—49 M 11 Claims



1. A method of fabricating a carton open at its opposite ends including:

providing a plurality of planar carton blanks,

disposing a plurality of blanks in a horizontal stack,

conveying carton blanks one after the other along a predetermined path,

disposing the carton blanks one after the other about a substantially vertically disposed elongated form forming a portion of said path including displacing the cartons one by one from the stack and transporting each blank in a substantially vertically upward direction, and reversing the direction of travel of each blank after transport in the vertically upward direction for movement in a substantially vertically downward direction about the form, said form having the cross-sectional shape of the fabricated open ended carton,

wrapping each carton blank about the form,

overlapping opposed side flaps of each carton blank one over the other along one side of the form to close the blank about the form,

gluing the overlapped side flaps of each carton one to the other,

displacing the closed carton blank substantially vertically along the form,

maintaining the sides of the closed carton blank against the form as the closed carton blank is displaced therealong, and

discharging the open-ended carton from the form in a substantially vertical orientation with the opposite ends thereof opening vertically.

4,074,619

HEADING MACHINE

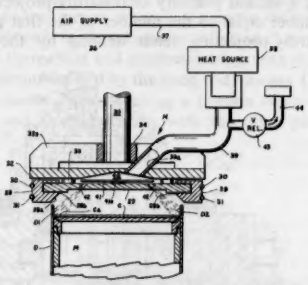
James J. Feliks, Doraville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 10, 1976, Ser. No. 740,476

Int. Cl.[2] B31B *17/60*

U.S. Cl. 93—55.1 R 8 Claims

1. A heading machine for securing the outer peripheral sealing edge area of a closure plate to an inner sealing area at one end of a tubular element, at least one of said sealing areas being coated with thermoplastic material, said machine comprising a mandrel for supporting a tubular element thereabout with an end of said tubular element projecting beyond an end of said mandrel to define a sealing area on the inner surface thereof and with a closure plate disposed within said end of said tubular element and in engagement with said end of said mandrel, a reciprocable header including a support element, a pressure pad mounted on said support element and defining a manifold therebetween, a plurality of jet passages formed in



said pressure pad and arranged to direct hot air from said manifold toward said sealing area and said sealing edge area, and outwardly expandable inwardly biased crimping segments mounted on said pressure pad and arranged to engage and crimp the projecting end of said tubular element inwardly, said pressure pad being engageable with the crimped projecting end of said tubular element and being effective to impart sealing force thereto.

4,074,620

DEVICE FOR PREVENTING THE FLOW OF AIR THROUGH AN OPENING BETWEEN TWO ROOMS OR SPACES

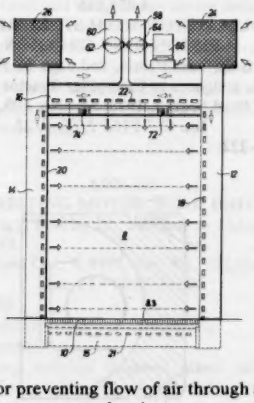
Bror Ingvar Erling Jansson, Henriksdalsringen 75 nb, S-131 00 Nacka, Sweden

Filed Oct. 28, 1976, Ser. No. 736,673

Claims priority, application Sweden, Nov. 6, 1975, 7512468

Int. Cl.[2] F24F *9/00*

U.S. Cl. 98—36 21 Claims



1. A device for preventing flow of air through an opening in a wall between two spaces wherein

air flow generating members are provided to generate by air exhaust at least two air curtains in each space,

said two curtains originating from the vicinity of the whole length of two opposite boundary edges of the opening,

said air curtains being directed obliquely towards each other to form a wedge-shaped air curtain arrangement directed into each of the spaces,

said arrangement defining a closed air volume which fills the whole opening and extends therethrough a certain length into each of the spaces,

each of said air flow generating members for generating the air curtains in each of the spaces being adapted to take in air for exhaust from the same space into which the air is exhausted,

sensing members at the opening for sensing the air flow therethrough and the direction of the net air flow through the opening,

regulating means connected to said sensing members and to said air flow generating members and responsive to the detection of the direction of air flow by said sensing members to regulate the air curtains so that the net air flow is stopped.

4,074,621

INFUSION-MAKING MACHINE

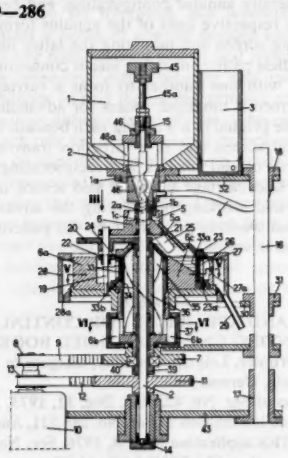
Serge Leon Louis Cailliot, Neuilly-sur-Seine, France, assignor to Societe Normande de Services, Colombes; Anvar Agence Nationale de Valorisation de la Recherche, Neuilly-sur-Seine; Societe Generale pour le Financement de l'Innovation Soginnove, Paris; Bertrand Cor, Paris and Arnaud Gastinne, Paris, all of, France, part interest to each

Filed June 11, 1976, Ser. No. 694,939

Claims priority, application France, June 13, 1975, 75 18665; Feb. 26, 1976, 76 05377

Int. Cl.[2] A47J *31/22, 31/24, 31/42*

U.S. Cl. 99—286 **20 Claims**



1. In an infusion making machine comprising:

a rotatably mounted central shaft threaded near its upper end,

a grinding chamber encircling said threaded part, and

means for introducing a solid flavored material into said grinding chamber, the improvement which comprises:

planetary gearing encircling said shaft and means for rotating said gearing and said shaft,

an eccentric, circular housing surrounding said shaft, and defining a centrifuging chamber, said housing being mounted to be driven by said gearing at a speed less than that of said shaft,

means for leading a liquid and ground material from said grinding chamber into said centrifuging chamber,

a self-cleaning filter on the inside of said centrifuging chamber,

a scraper carried by said gearing for removing residue from said filter, and means for leading said residue and an infusion separately from said machine.

4,074,622

APPARATUS FOR THE CONTINUOUS PRODUCTION OF STANDARDIZED MILK

Heinrich Niemeyer, Oelde, Germany, assignor to Westfalia Separator AG, Oelde, Germany

Filed Apr. 20, 1976, Ser. No. 678,589

Claims priority, application Germany, Apr. 23, 1975, 2517938

Int. Cl.[2] A23C *9/00, 13/02*

U.S. Cl. 99—456 **4 Claims**

1. Apparatus for the continuous production of standardized milk having a predetermined fat content from raw milk having a variable and higher fat content which comprises:

a. a separator for separating the raw milk into separated cream and skim milk and having an inlet line for feeding of raw milk to the separator, a first discharge line for separated cream, and a second discharge line for skim milk,

b. a by-pass line interconnecting said discharge lines for conveying a portion of the separated cream to the skim milk for remixing of cream with the skim milk to provide standardized milk in the second discharge line, and a regulating valve mounted in one of said lines for said separated cream for proportioning the amount of cream remixed with the skim milk,

c. means for withdrawing a sample of the standardized milk from the second discharge line, which means is connected with the second discharge line,

d. a first two-way valve in the first discharge line downstream of the by pass line for receiving cream not remixed with the skim milk and having a first outlet and a second outlet, a conduit connected to the first outlet for discharge of separated cream from the process,

e. a second two-way valve in the second discharge line downstream of the connection of the sampling means to the second discharge line, having a first outlet and a second outlet, a conduit connected to the first outlet of the second two-way valve for discharge of standardized milk from the process,

f. a recycle conduit connected to each of the second outlets of the two two-way valves for recycling of separated cream and standardized milk to the separator,

g. a fat test and controller for receiving the withdrawn sample and determining the fat content thereof and effective to control the regulator valve, and to control the two-way valves for discharge of separated cream and standardized milk when the fat content of the standardized milk is within preselected tolerances and recycle separated cream and standardized milk to the separator when the fat content of the standardized milk is outside of the preseclected tolerances.

4,074,623

METHOD FOR BINDING A CROP BALE

Allen A. White, Peabody, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed Nov. 16, 1976, Ser. No. 742,178

Int. Cl.[2] B65B *13/28*

U.S. Cl. 100—3 **10 Claims**

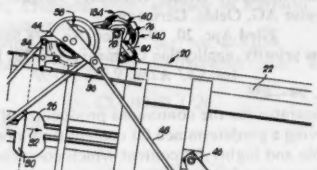
1. In a baling operation where a bale is progressively formed and incrementally advanced through a baling chamber by intermittently packing successive charges of new material against a source of yieldable resistance across the path of travel of the bale, a method of binding the bale that includes the steps of:

prior to packing the first charge of a bale, joining a pair of binding strands from two separate sources of supply for a first time to start a loop and present a bight across the baling chamber;

simultaneously drawing additional lengths of the strands from the two sources of supply as the bight is progressively lengthened by the packing of material into the bight; and

when the bale has reached a predetermined size, closing the

bight around the bale to form a complete loop and joining the strands for a second time at the point of completion of the loop,



the second joining of strands for one bale and the first joining of strands for the next succeeding bale being carried out successively.

4,074,624

METHOD OF ADJUSTING THE CONTACT PRESSURE OF A ROLLING MILL AND APPARATUS FOR THE PERFORMANCE THEREOF

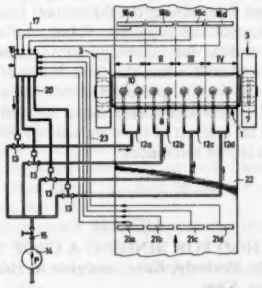
Peter Biörnstad, Zurich, and Anton Dolenc, Winterthur, both of Switzerland, assignors to Escher Wyss Limited, Zurich, Switzerland

Filed Nov. 15, 1976, Ser. No. 742,366

Claims priority, application Switzerland, Dec. 8, 1975, 15950/75

Int. Cl.[2] B30B *13/00*, B21B *13/02*; B30B *3/04*

U.S. Cl. 100—35 **15 Claims**



1. A method of adjusting the contact pressure of a rolling mill for rolling a web of material, comprising the steps of:

providing at least one pair of rolls comprising at least one controlled deflection roll equipped with a plurality of hydrostatic pressure elements operable by a hydraulic pressure medium and a counter-roll cooperating with said controlled deflection roll;

passing a web of material through the nip between the controlled deflection roll and the counter-roll;

measuring at a number of measuring locations across the web of material the action of the pair of rolls upon the throughpassing web of material after the web of material has departed from the nip of the pair of rolls to form measured values characteristic of such action of the pair of rolls; and,

adjusting the pressure of the pressure medium fed to the individual pressure elements associated with the measuring locations in accordance with said measured values so as to obtain a required reference value at the measuring locations.

4,074,625

SCREEN PRINTING MACHINE

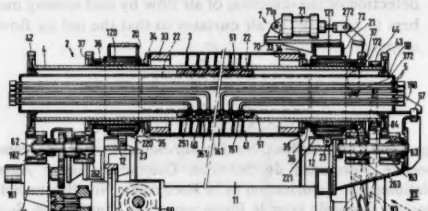
Mathias Mitter, Falkenstrasse 57, 4815 Schloss Holte, Germany

Filed Sept. 27, 1976, Ser. No. 726,875

Claims priority, application Germany, Sept. 29, 1975, 2543423

Int. Cl.[2] B41F *15/38, 15/10*

U.S. Cl. 101—128.1 **15 Claims**



1. A screen printing machine, comprising an endless printing screen of generally annular configuration; end bearing units located at the respective ends of the annulus formed by said endless printing screen and mounting the latter for advancement in an endless path; connecting means connecting said end bearing units with one another to form a carriage unit on which said screen is mounted; means for advancing a workpiece web to be printed in a working path beneath the annulus formed by said screen and in a direction transverse to the longitudinal axis of said annulus; and reciprocating means for reciprocating said carriage unit and said screen in direction transverse of said working path during the advancement of said web in said working path whereby the patterning on the workpiece web is varied.

4,074,626

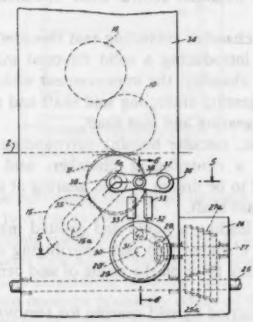
METHOD AND APPARATUS FOR CONTINUOUSLY PRINTING UNCASED FOLDED BOOKS

Hans-Dieter Werner, Leipzig, Germany, assignor to VEB Polygraph, Leipzig, Germany

Continuation of Ser. No. 423,815, Dec. 11, 1973, Pat. No. 3,964,387, which is a division of Ser. No. 285,521, Aug. 31, 1972, abandoned. This application Mar. 8, 1976, Ser. No. 664,802

Int. Cl.[2] B41F *5/06, 13/50*

U.S. Cl. 101—221 **2 Claims**



1. In an arrangement for printing books, newspapers, and the

like, in combination, transporting means for continuously transporting a paper web along a predetermined path; *n* page printing machines, *n* being an integer equal to at least three, the *n* printing machines being arranged spaced from one another along the path, each so arranged that whenever activated it prints upon the travelling web always the same respective one of *n* different page imprints; control means for so controlling the *n* machines that each becomes activated and prints its associated page imprint upon the web only during each *n*th cycle and after so printing is kept unactivated and does not print upon the web for the next-following *n* minus one cycles, a cycle being constituted by the time interval required for an arbitrarily selected reference point on the travelling web to travel a preselected distance along the path, the control means including means for so controlling the timing and sequence in which the individual ones of the *n* machines become activated and print that in so printing each machine prints upon a longitudinal section of the paper web not printed upon by any of the others of the *n* machines; and means for cutting off successive printed portions of the web to form discrete sheets and assembling together such sheets, each printing machine being a page printing machine including a page printing roller set, each set being mounted for movement between an inoperative position and a printing position in which it always produces one and the same page imprint, wherein each of said printing roller sets includes a pair of printing rollers spaced from each other when in said inoperative position and in contact with opposite sides of said web when in said printing position so that both sides of each web section are imprinted, and wherein said control means includes a series of control devices operatively connected with one roller of each pair of said printing rollers for moving the respective roller between said inoperative and printing positions so that the moved printing roller is in said printing position during one revolution, wherein the printing rollers of each pair are horizontal and include an upper and a lower roller on opposite sides of said web, wherein said control devices are connected with respective ones of said lower rollers for moving the same between a higher printing position and a lower inoperative position spaced from said web and from the respective upper roller, and wherein said web sags to a position downwardly spaced from said upper roller when said lower roller is moved to said lower inoperative position.

4,074,627

APPARATUS FOR PREVENTING NON-UNIFORM APPLICATION OF INK

Norbert Otto Eck, Zell; Siegfried Alfons Stark, Rottendorf, and Erich Georg Wieland, Wurzburg, all of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany

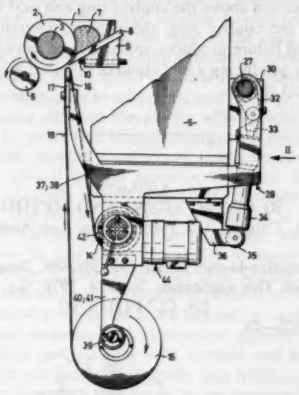
Filed Dec. 6, 1976, Ser. No. 747,750
Claims priority, application Germany, Dec. 12, 1975, 2555993
Int. Cl.[2] B41F *35/00*
U.S. Cl. 101—425 **10 Claims**

1. Apparatus for preventing the unwanted build up of particles of printing ink on the edge of a doctor blade in an ink fountain for a rotary printing press and for removing any built up particles, said apparatus comprising:

a support blade generally parallel with the edge of the doctor blade, said support blade being positioned closely adjacent to but spaced from the doctor blade;

a movable cleaning web advanceable transversely over said support blade and close to the edge of the doctor blade to contact built up ink particles and remove the built up ink particles from the doctor blade;

means for advancing said cleaning web; and



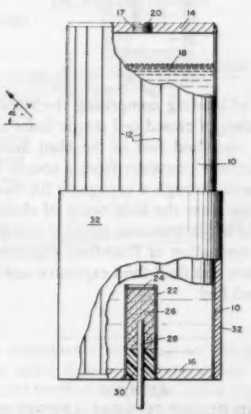
means for varying the position of said support blade with respect to the doctor blade to vary the spacing of said support blade from the doctor blade.

4,074,628

FAX CANISTER WITH A BOTTOM BURSTER CHARGE AND DISPERSION CONTROL RING

Larry G. Manning, Ridgecrest, Calif., and Richard J. Zabelka, Brimley, Mich., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 21, 1966, Ser. No. 560,377
Int. Cl.[2] F42B *25/12*
U.S. Cl. 102—6 **1 Claim**



1. Apparatus for dispersing fuel into the atmosphere for mixing therewith to produce an explosive cloud, comprising:

(a) a cylindrical canister having upper and lower non-failing end walls, adapted to be oriented in the air with its longitudinal axis in a generally vertical direction,

(b) a burster tube disposed adjacent the lower end wall and extending part way the length of the canister, said burster tube containing a high explosive adapted to produce a shock wave when detonated,

(c) a dispersion control ring surrounding the canister and extending from the lower wall to about the mid-portion of the canister, and

(d) a fuel contained within the canister and substantially filling the same,

(e) the construction and arrangement being such that when the detonator is actuated the canister first fails radially in the portion above the control ring and next fails, together with the control ring, therebelow, whereby the second named failure produces upwardly and outwardly components, producing a fuel cloud of inverted generally frustoconical shape.

4,074,629

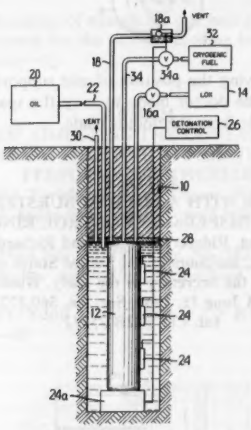
BLASTING AGENT AND METHOD

Stirling A. Colgate, 122 Piedra Loop, Los Alamos, N. Mex. 87544

Continuation-in-part of Ser. No. 590,489, June 25, 1975, abandoned. This application Sept. 24, 1976, Ser. No. 726,183

Int. Cl.[2] F42D *1/00*

U.S. Cl. 102—23 **9 Claims**



1. A method of blasting comprising the steps of placing a cryogenic container of closed cell plastic foam in a blast hole, placing at least one fluid fuel in the blast hole, conducting liquid oxygen into the container from a source safely remote from the blast hole through a cryogenic fill line, at least the part of the fill line near the hole being of closed cell plastic foam, and setting off at least one initiator charge in the blast hole to initiate detonation or fluid-fluid explosive self-mixing or both detonation and fluid-fluid explosive self-mixing of the liquid oxygen and fuel.

4,074,630

METHODS AND PLUGS TO SEAL APERTURES IN TUBE PLATES OF HEAT EXCHANGERS PROVIDED WITH TUBE PLATES WHICH ARE LOCALLY SEALED WITH THESE METHODS AND SUCH PLATES

Nicolaas Abraham Zondag, Roosendaal, Netherlands, assignor to Explosive Metal Working Holland B.V., Roosendaal, Netherlands

Division of Ser. No. 662,045, Feb. 27, 1976, Pat. No. 4,021,907. This application Feb. 10, 1977, Ser. No. 767,454

Int. Cl.[2] F42B *3/04*; F16L *55/10*; F28F *11/00*

U.S. Cl. 102—24 R **5 Claims**

1. An explosively radially expandable plug to seal an aperture in a tube plate of a heat exchanger in a place, where a tube extends with an end portion in a boring of said plate, said plug having a metal body with two coaxial walls forming cavities separated from one another by a partition and each one of said

cavities opening towards an individual end of the plug and containing an explosive charge with firing means.

4,074,631

BALLAST TAMPING IMPLEMENT ON A MOBILE TRACK TAMPER

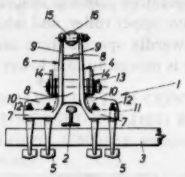
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed June 14, 1976, Ser. No. 695,732

Claims priority, application Austria, Feb. 20, 1976, 1239/76

Int. Cl.[2] E01B *27/16*

U.S. Cl. 104—12 **5 Claims**



1. A ballast tamping implement mounted on a mobile track tamper arranged for mobility on a track consisting of a multiplicity of ties and two rails fastened to the ties, the tamping implement being capable of tamping ballast under respective ones of the ties and constituted by a rigid unit consisting essentially of

1. a tamping tool holder having
   a. an arm having a longitudinal plane of symmetry and mounted on the tamper for pivoting in a plane vertical to the track and passing through a respective one of the rails, the longitudinal plane of symmetry of the tamping tool holder arm extending on the vertical plane, and
   b. two arms rigidly connected to, and extending transversely of the track from, the vertically extending arm to the left and to the right of the vertical plane whereby the tamping tool holder is centered with respect to the one rail, and
2. at least one stationary ballast tamping tool mounted on each of the transversely extending holder arms and extending vertically downwardly from the holder arms for immersion in the ballast to the left and to the right of the one rail.

4,074,632
SWITCH FOR MONORAIL TRACK WITH ROTARY DRIVE SHAFT

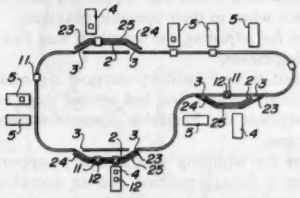
Yutaka Kurahasi, and Nobuyuki Ihara, both of Tokyo, Japan, assignors to SI Handling Systems, Inc., Easton, Pa.

Filed Dec. 11, 1975, Ser. No. 639,938

Claims priority, application Japan, Dec. 13, 1974, 49-150420[U]

Int. Cl.[2] B61B *13/12*; E01B *25/12*

U.S. Cl. 104—130 **14 Claims**



1. Apparatus comprising:

a. a main conveyor line and an auxiliary conveyor line, a junction between said lines,

b. each conveyor line having only one track and a horizontally disposed drive shaft, said shafts being rotatable about their longitudinal axes and being disposed below the elevation of said track,

c. at least one vehicle for movement along said lines, said vehicle having a wheel for rolling contact with a horizontal surface of said tracks and a drive wheel for frictional contact with said shafts, means biasing said drive wheel so that its axis of rotation is angled with respect to the longitudinal axis of one of said shafts,

d. a transfer means at said junction for transferring the vehicle between said lines in a manner so that said drive wheel is transferred from driving contact with one shaft to driving contact with the other shaft, and

e. means associated with the auxiliary conveyor line adjacent the junction for changing the speed of the vehicle.

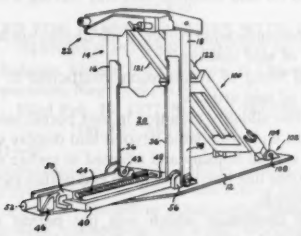
4,074,633
TRAILER HITCH HAVING ELASTOMER-IN-SHEAR CUSHIONING IN THE DIAGONAL STRUT

Paul E. Hicks, Jr., Florissant, and James C. Hammonds, St. Charles, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 457,256, April 2, 1974, abandoned. This application Aug. 1, 1975, Ser. No. 601,149

Int. Cl.[2] B65J *1/22*; B60P *7/00*

U.S. Cl. 105—368 B **28 Claims**



1. In a trailer hitch for holding piggyback highway trailers in place on a railway flat car deck including a generally vertical support member having means at its lower end pivotally mounting the vertical support member on the deck, and having pivotally mounted thereon at its upper end a kingpin engagement assembly for holding in place the kingpin of a highway trailer; a diagonal strut extending longitudinally with respect to said deck, the improvement comprising:

an energy absorbing cushioning assembly mounted within said diagonal strut; said cushioning assembly including a longitudinally extending fixed member inclined with respect to said deck; said fixed member having means integral therewith for affixing the same to the deck of a railway car; a pair of longitudinally extending movable members spaced on either side from said fixed member, also inclined with respect to said deck; said movable members having means attached thereto for affixing said movable members to one of said kingpin engagement assembly and said vertical support member; at least one cover plate integrally affixed to said movable members; a resilient assembly integrally affixed to said fixed and said movable members, said resilient assembly comprising at least one elastomeric member having a hardness withn the range of about 40 to 70 durometer; the ability to absorb at least about 35 ft. lbs. of energy per cubic inch, and the ability to absorb at least about 100,000 pounds of force in 9 inches of travel; whereby when loads are applied to said kingpin engagement assembly said elastomeric member will deflect in shear and cushion both vertical and horizontal components of said applied loads; said hitch comprising means for lowering said hitch to an inoperative hitch position wherein said diagonal strut extends generally horizontally adjacent the car deck, and wherein said hitch does not extend vertically more than about 6 inches above the deck in said inoperative position.

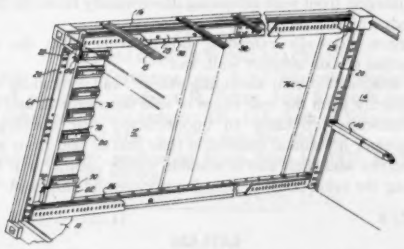
4,074,634
CARGO CONTAINER WITH A CARGO RESTRAINT SYSTEM HAVING ADJUSTABLE PANELS

Conley H. Snow, Clawson, Mich., and Rudolph Messerschmidt, Alexandria, Va., assignors to Brooks & Perkins, Incorporated, Southfield, Mich., by said Snow and The United States of America as represented by the Secretary of the Army, Washington, D.C., by said Messerschmidt

Filed Mar. 22, 1976, Ser. No. 668,924

Int. Cl.[2] B61D *45/00*

U.S. Cl. 105—493 **6 Claims**



1. A cargo container comprising an elongated container having a cargo space defined between a floor, longitudinally extending parallel vertical side walls, and a top wall,

said container having vertical load-sustaining metal posts at the four corners thereof,

a pair of upper rails extending longitudinally of the container at opposite sides thereof, and each upper rail fixed at its ends to the upper portions of the posts at one side of the container,

a pair of lower rails extending longitudinally of the container at opposite sides thereof and fixedly secured thereto,

a plurality of vertically elongated panels dimensioned to extend between the upper and lower rails,

releasable locking means carried in part by said rails and in part by said panels adjacent the upper and lower ends thereof, said locking means when released permitting movement of said panels into desired positions longitudi-

nally of said rails and engageable thereat to lock said panels in the desired positions,

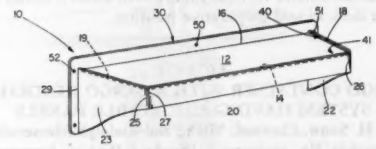
each of said panels having a plurality of vertically spaced horizontal belt rail portions each provided with a series of latch-receiving openings for receiving latch elements provided at opposite ends of cargo restraint bars adapted to be latched to extend between oppositely positioned pairs of panels locked at required positions longitudinally of said rails, the upper ends of said panels being located directly beneath said upper rails whereby the uppermost belt rail portions on said panels are below said upper rails, said upper rails being each provided along the inner side thereof with an elongated continuous recess, and an upper belt rail secured to each of said upper rails to overlie said recess from end to end, said upper belt rail having a series of latch-receiving openings for the latch elements provided at the end of the cargo restraint bars.

4,074,635

PLASTIC SHELF UNIT

Alfred G. Stauble, Hollis, N.H., assignor to Belleview, Inc., Hollis, N.H.

Filed Mar. 28, 1977, Ser. No. 781,685
Int. Cl.[2] A47B *17/00*
U.S. Cl. 108—27 **5 Claims**



1. An integrally molded, one-piece, nestable, plastic shelf unit comprising,

a flat horizontal support wall having a front edge, a rear edge longer than said front edge, and side edges extending therebetween, the distance between said side edges increasing rearwardly,

an integral front wall extending downwardly from the front edge of said support wall,

integral sidewalls extending downwardly from the side edges of said support wall, and

an integral external mounting flange wall extending outwardly from the rear edges of said support wall and said sidewalls providing an unobstructed rear opening of greater horizontal dimension than that of said front wall,

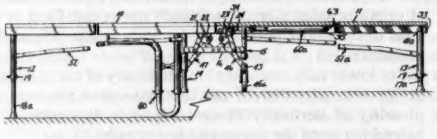
whereby said shelf unit is nestable within another unit having the same construction, for storage and shipment.

4,074,636

ELEVATIONALLY ADJUSTABLE FOLDING STAGE

Kermit H. Wilson, 7001 Antrim Road, Edina, Minn. 55435

Continuation-in-part of Ser. No. 638,167, Dec. 5, 1975, Pat. No. 3,991,491. This application Dec. 27, 1976, Ser. No. 754,334
Int. Cl.[2] A47B *3/00*
U.S. Cl. 108—113 **6 Claims**



1. A foldable, height adjustable stage, comprising:

(a) first and second main support legs interconnected to form a base frame;

(b) first and second stage surface members;

(c) means hingeably connecting said first and second stage surface members to said base frame for movement between a storage position wherein said stage surface members are generally vertically disposed above said base frame, and an operable position in which said stage surface members are generally horizontally disposed to define a continuous stage surface;

(d) first and second outer leg means connected to said first and second stage surface members respectively, remote from said base frame for supporting said stage surface members when in their operable positions;

(e) means for adjusting the length of said first and second outer leg means;

(f) first and second auxiliary support leg means mounted respectively to said first and second stage surface members adjacent the hingeable connection thereof to said base frame;

(g) means for adjusting said auxiliary support leg means between a storage position and an operable position in which said support legs extend outward from said stage surface members further than said main support legs for supporting said stage in an elevated position; and

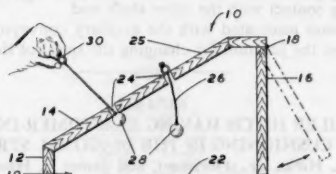
(h) said auxiliary support leg means including floor or surface contacting portions which extend, when said stage is in an elevated position, towards the center of said stage beneath the hingeable connection of said stage surface members to said base frame, so as to further support the center portion of said stage in its elevated position.

4,074,637

PILFER PROOF DISPLAY UNIT

Cornelius Lorenzen, Jr., 338 Runny Mede Road, Essex Fells, N.J. 07021

Filed Apr. 9, 1976, Ser. No. 675,470
Int. Cl.[2] E05G *1/10*
U.S. Cl. 109—38 **5 Claims**



1. A pilfer proof display case, which comprises;

a housing including sidewalls and a bottom wall;

an open tray adapted to support an article for display, mounted on said housing, said tray having a display surface;

a portal communicating between the display surface and the interior of said housing;

said portal being of a dimension insufficient to permit the passage of said articles;

a flexible line slidably mounted in said portal, said line having a first end extendable beyond said display surface and outside of said housing and adapted to secure said article, said flexible line having a second end within the interior of said housing;

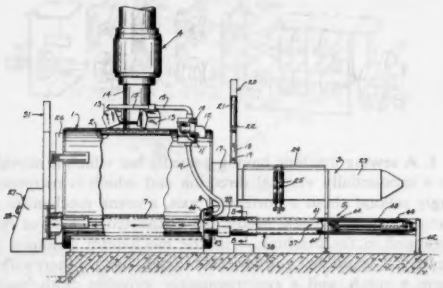
a mass of dimension which will not permit its passage through said portal, connected to said second end, said mass being positioned within said housing so as to be free of impinging with the sidewalls thereof;

an audible alarm, mounted on said housing beneath said mass, said alarm being activatable by being struck by said mass, which occurs upon the release of said mass by removal of the connection between said mass and said article.

4,074,638
APPARATUS FOR AGITATING AND REMOVING NON-COMBUSTIBLE MATERIAL FROM AN INCINERATOR

Benjamin U. Miller, Hales Corners, Wis., assignor to Kelley Company, Inc., Milwaukee, Wis.

Filed July 16, 1976, Ser. No. 705,760
Int. Cl.[2] F23G *5/00*; F23K *3/12*; F23J *1/00*
U.S. Cl. 110—8 R **10 Claims**



1. An apparatus for agitating and removing non-combustible material from a combustion chamber, comprising a housing defining a chamber to receive waste material and having a discharge opening and having a second opening aligned with the discharge opening, a door to enclose said discharge opening and movable between an open and a closed position, a ram disposed for movement within said second opening between a retracted position wherein the ram is located outside of the chamber and an extended position wherein the ram extends across said chamber toward said discharge opening, and a cylinder unit disposed outside of said housing and operably connected to said ram for moving said ram between said retracted and extended positions, said cylinder unit includes a pair of generally parallel vertically disposed cylinders with each cylinder having a piston rod slidably disposed therein, the piston rod of the lower cylinder of said pair being connected to a fixed object and the piston rod of the upper cylinder of said pair being connected to said ram, and connecting means for connecting the cylinders together, extension of the piston rod with respect to said upper cylinder acting to move the ram in a first stroke of movement and extension of said lower cylinder with respect to its piston rod acting to move the ram in a second stroke of movement, partial extension of said ram acting to agitate the waste material in the chamber and urge the partially combusted waste toward said discharge opening and full extension of said ram acting to discharge non-combustible material through said discharge opening.

4,074,639
TRAILER FOR FARM TRACTORS WITH DRIVEN MEMBER POWERED BY P.T.O.

James H. Hodgson, Vinton, Iowa, assignor to Chromalloy American Corporation, New York, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,380
Int. Cl.[2] A01C *23/02*
U.S. Cl. 111—6 **8 Claims**

1. In combination, a support vehicle attached to a draft connection of a farm tractor which has a three point hitch and which has a power take-off in a horizontal plane above the level of the draft connection, and a soil working implement which is carried on said three point hitch and extending rearwardly of said draft connection, said soil working implement being movable by said three point hitch between a ground engaging position and a raised position, said support vehicle comprising, in combination:

a wheeled chassis;

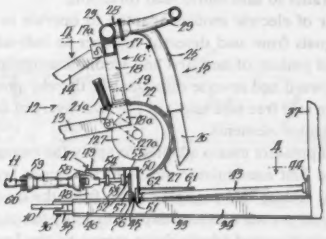
a draft tongue at the front of said chassis at the level of the draft connection extending forwardly past said soil working implement and attached to said draft connection, the length of said draft tongue being sufficient that when the tractor is turned relative to the draft tongue interference between the soil working implement and the front of the chassis is avoided;

a driven member mounted at the front of the support vehicle;

and power transmission means for detachably connecting said driven member for operation from the tractor power take-off, said power transmission means including,

a drive shaft extending along the draft tongue below the horizontal plane of the power take-off,

an input shaft supported on the forward portion of the draft



tongue in the horizontal plane of the power take-off, the rear of said input shaft, said drive shaft and said draft tongue, being so related to the soil working implement that when the soil working implement is raised by the three point hitch the lowermost part of said implement clears the rear of the input shaft and vertically clears the draft tongue and the drive shaft, so the tractor may be turned relative to the draft tongue without interference between said implement and any of said input shaft, said draft tongue and said drive shaft,

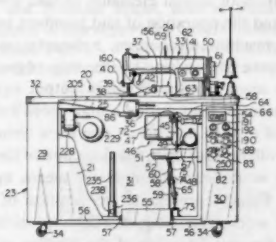
means on the input shaft to detachably receive a drive link to the power take-off,

and means drivingly interconnecting the input shaft with the drive shaft.

4,074,640
AUTOMATIC SEWING MACHINE

Takashi Chano, Yokohama, and Kohji Masuda, Sagamihara, both of Japan, assignors to Tokyo Juki Kogyo Kabushiki Kaisha and Kayaba Industry Co., Ltd., both of Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 664,038
Claims priority, application Japan, Mar. 13, 1975, 50-29557; Aug. 20, 1975, 50-101556
Int. Cl.[2] D05B *19/00, 33/00, 35/10*
U.S. Cl. 112—121.11 **8 Claims**



1. An automatic sewing machine comprising:

a sewing machine mechanism including a table, a seam forming mechanism for sewing two superposed layers of fabric together and a fabric feed mechanism,

a detector member disposed upstream of said seam forming mechanism in a fabric feed direction and including a pair

of detector elements each sensing individually each free side edge of said two layers of fabric and independently generating a signal representative thereof,

a separator plate disposed upstream of said seam forming mechanism in said feed direction and adapted to be positioned between free side edges of said two layers of fabric,

a first manipulator means adapted to engage the upper surface of the upper fabric layer on the upper side of said separator plate and having a pinion rotatable about an axis parallel to said fabric feed direction,

a second manipulator means adapted to engage the lower surface of the lower fabric layer on the lower side of said separator plate and having a pinion rotatable about an axis parallel to said fabric feed direction,

a pair of electric motors adapted to operate in response to signals from said detector member to individually rotate said pinions of said first and second manipulator means in forward and reverse directions to thereby positively position said free side edges of the two layers of fabric on said detector elements,

a first pressure means adapted to apply the engaging force of said first manipulator means to the upper layer of fabric and release said engaging force from the layer,

a second pressure means adapted to apply the engaging force of said second manipulator means to the lower layer of fabric and release said engaging force from the layer, and

means for retracting said first and second manipulator means from said upper and lower layers of fabric, respectively, when said engaging forces of the first and second manipulator means are released from the layers of fabric.

6. An automatic sewing machine comprising a sewing machine mechanism having a table, a presser foot, a lever for lifting said presser foot, and an electric motor mechanism having a clutch and a lever for operating said clutch, an air cylinder for operating said presser foot lifting lever, an air cylinder for shifting said clutch operation lever, an air table disposed at a selected position on said table and including a plurality of air holes which are slanted in the direction of advancement of the workpieces and which are arranged in a surface in contact with the workpieces so as to facilitate advancing movement of the workpieces, a stacker having supporting rods, a rockable gripping bar for gripping an intermediate portion of sewn workpieces in cooperation with said supporting rods when a sewing operation on the workpieces has been completed, blower means for blowing the trailing half portion of the sewn workpieces off said table to stack such trailing half portion of the workpieces onto said supporting rods while the sewn workpieces are being gripped by said gripping bar, controller means for effecting sequential control of the operation of driven elements of said sewing machine mechanism and the operation of said members associated with said sewing machine mechanism, a detector member means adapted to sense the position of free side edges of the workpieces to be sewn in response to an output signal from said controller means at least during a high speed forward sewing operation and to then provide an operation termination signal to said controller means upon the detection of the terminal end of the sewn workpieces, manipulator means operable in response to a signal representing the position of the free side edges of the workpieces from said detector member means to compensate for any deviation of the position of the free side edges of the workpieces, and an auxiliary guide means positioned at the front edge of said table to impart a clockwise moment to the workpieces as the workpieces are fed by the feed mechanism of the sewing machine mechanism, said auxiliary guide means including a sloped portion having an adjustable angle.

4,074,641

SEWING MACHINE

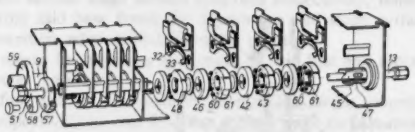
Lars Helge Gottfrid Tholander, Fagelstigen 7, and Kenneth Oscar Emanuel Skogward, Oxhagsgatan 147, both of Huskvarna, Sweden (S-56100)

Filed June 10, 1975, Ser. No. 585,564

Claims priority, application Sweden, June 13, 1974, 7407800

Int. Cl.[2] D05B *3/02*

U.S. Cl. 112—158 D **7 Claims**



1. A sewing machine having a needle bar which is movable in a substantially vertical direction and which is reciprocatingly pivotal about a horizontal axis, a crank mechanism arranged to operate said needle bar connected to a drive shaft arranged in the machine, a shuttle mechanism arranged beneath the needle bar and operable in conjunction therewith to form a stitch, and a reciprocatingly movable cloth-feeding means, a code converter and setting means, said code converter including means for converting a variable binary code to mechanical control movements determined by said setting means, at least one of the reciprocating movements effected by the needle bar and the cloth-feeding means being produced by said code converter for converting a variable binary code to mechanical control movements determined by said setting means, and drive means arranged in the code converter in dependence upon a central control unit which comprises coding means for transmitting binary coded signals to the code converter, said code converter comprising a plurality of sets of cam discs mounted and axially displaceable on a common shaft and individually adjustable with respect to a zero position by said setting means, each set of cam discs being disposed with axial cams facing one another, and stopping means and entrainers cooperating with the setting means, characterized in that said drive means comprises an oscillating motion mechanism means, means transferring limited movements determined by the magnitude of the oscillating motion to a first disc in each set of cam discs, said stopping means and entrainers co-operating with the setting means and being positioned in relation to the magnitude of the oscillating motion in the several cam sets to engage at the ends of the oscillating motion a second disc in each set of cam discs to produce relative movements between the discs in the respective cam sets, said limited movements being transferred as reciprocating movements to at least one of said needle bar and cloth-feeding means, respectively, of the sewing machine.

4,074,642

SEWING MACHINE WITH PROGRAMMABLE MEMORY

John Addison Herr, Garwood, N.J., assignor to The Singer Company, New York, N.Y.

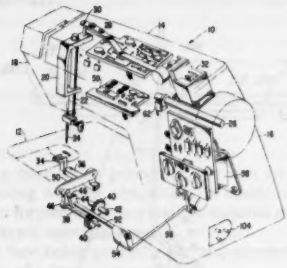
Filed July 27, 1976, Ser. No. 709,050

Int. Cl.[2] D05B *3/02*

U.S. Cl. 112—158 E **9 Claims**

1. In a sewing machine having stitch forming means operative to form successive stitches including mechanism for influencing the switch position coordinates of said successive stitches in the formation of a pattern of stitches, logic means responsive to input data representative of stitch position coordinates for producing stitch position coordinate electrical signals, actuating means responsive to signals from said logic means for controlling the position of said stitch forming means in accordance with input data fed to said logic means, and re-programmable programming means operable connected with said sewing machine, said programming means being

responsive to operator manipulation and including static memory means operative for storing digital input data corresponding to a stitch pattern selected by the operator and for transmitting electrical digital output signals to said logic means such that an operator may select a stitch pattern program for entry



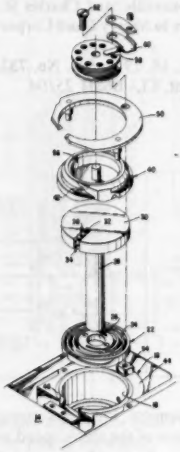
into the sewing machine for automatic reproduction of the switch pattern by the sewing machine and said programming means including a plurality of switching layers with each said layer being responsive when activated for producing voltage signals representative of input data of switch position coordinate information.

4,074,643

RAIL-BEARING FOR ROTARY SHUTTLES

Stanley Joseph Ketterer, Jamesburg, and William Weisz, Rockaway, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed June 21, 1976, Ser. No. 697,886
Int. Cl.[2] D05B *57/14*
U.S. Cl. 112—181 **3 Claims**



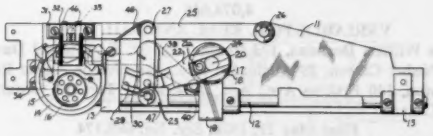
1. In a sewing machine having a thread carrying needle, a rotary shuttle, said shuttle being adapted for catching successive loops of needle thread in the formation of stitches, a drive mechanism for imparting movement to said shuttle, and stationary support means having a plane surface over which said shuttle moves, bearing means comprising cooperating and engaging structures formed circularly on the plane surface of said support means over which said shuttle moves and on the surface of said shuttle adjacent to said support means plane surface at least one of said bearing means projecting from the surface on which it is formed sufficiently to maintain a spaced relationship between the body of said shuttle and the plane surface of said support means and to singularly restrain radial movement of said shuttle relative to the axis of rotary movement thereof, and means for maintaining the engagement of said cooperating structures.

4,074,644

FEED MECHANISM FOR SEWING MACHINE

Kimikazu Matsuda, and Yoshihiro Yamaguchi, both of Osaka, Japan, assignors to Maruzen Sewing Machine Co., Ltd., Moriguchi, Japan

Filed Nov. 23, 1976, Ser. No. 744,315
Claims priority, application Japan, Dec. 20, 1975, 50-172345[U]; Dec. 22, 1975, 50-154187
Int. Cl.[2] D05B *27/02*
U.S. Cl. 112—215 **5 Claims**



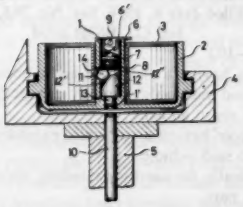
1. An actuating mechanism for the feed dog of a sewing machine comprising a rigid lever mounted for rocking movement about a first fixed vertical axis and having an aperture at its distal end, a driving element, means operatively connecting said lever with said driving element for imparting oscillating rocking movement to said lever, a feed dog support carrying a feed dog, said support having a horizontal slot and a vertical pin bridging said slot with the pin passing through the opening in the lever, the axis of said pin constituting a second vertical axis, the feed dog support thereby being oscillative angularly and vertically on said second vertical axis relative to said lever, an arcuate guideway for controlling the attitude of said feed dog support, the radius of curvature of said guideway being equal to the radial distance between said first and second vertical axes, a control arm rigid with said feed dog support and having an end portion received in said guideway, said feed dog support when oscillated by said lever being caused to be rocked by said guideway about said second vertical axis relative to said lever so as to maintain the feed dog substantially in a straight line work feeding attitude, and means operatively connecting said driving element with said feed dog support for oscillating said feed dog support vertically in synchronism with its angular oscillating movement.

4,074,645

CONTROLLED BRAKING DEVICE FOR THE GRIPPER-THREAD BOBBIN OF A DOUBLE LOCK-STITCH SEWING MACHINE

Gunter Droste, Leopoldshohe; Klaus-Dieter Seiler, both of Kirchlengern, and Wilhelm Stapel, both of Bunde, all of Germany, assignors to Durkoppwerke GmbH, Bielefeld, Germany

Filed Dec. 17, 1976, Ser. No. 751,976
Claims priority, application Germany, Dec. 19, 1975, 405651
Int. Cl.[2] D05B *63/00*
U.S. Cl. 112—229 **9 Claims**



1. A gripper-thread bobbin brake for a double lock-stitch

sewing machine which comprises the combination with a bobbin housing having a spindle adapted to receive a bobbin with a core of the bobbin surrounding said spindle, and a gripper-shaft axially aligned with said housing and said spindle, of:

a brake element in said housing juxtaposed with said bobbin;

a brake plunger received in said spindle and axially displaceable therein for shifting said brake element into engagement with said bobbin; and

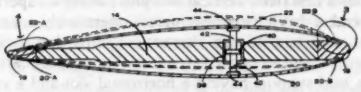
an actuating rod extending through said shaft and engageable with said plunger for displacing same to engage said element with said bobbin, said spindle being provided with at least one opening, said element projecting through said opening into engagement with said bobbin upon actuation of said rod.

4,074,646

VARIABLE FOIL KEEL AND SAIL BOAT

Jan William Dorfman, 173 Roxborough St. E.; Michael David Nisbet Carson, 39 Addington Ave., and George Angus Rolston, 140 Erskine Ave., Apt. 2804, all of Toronto, Ontario, Canada

Filed May 21, 1976, Ser. No. 689,174
Int. Cl.[2] B63B *3/38*
U.S. Cl. 114—39 **10 Claims**



1. A sailboat of the type having a hull and at least one underwater appendage, said appendage comprising:

a core portion, attached to said hull;

flexible skin portions attached on either side of said core portion, and being movable between a generally retracted inward position alongside said core, and an extended outwardly bulged position, the maximum extension of said skin portion extending along an axis lying in a generally upward and downward direction intermediate the fore and aft edges of the core, whereby to provide an appendage having a horizontal cross-section which may be outwardly bulged on one side and flatter on the other side;

a cylinder, a fluid medium adapted to be pumped into and released from said cylinder, a piston within said cylinder, two operating rods connected with said piston, extending from said cylinder on opposite sides of said core, said cylinder being located in said core, and said operating rods communicating with respective said skin portions on opposite sides of said core portion whereby said skin portions may be selectively bulged outwardly from the core portion and retracted inwardly towards the core portion.

4,074,647

SAILING RIG HAVING CAMBER ADJUSTMENTS

Richard D. Delaney, 12 Parkview Drive, Conneaut, Ohio 44030

Filed July 8, 1976, Ser. No. 703,414
Int. Cl.[2] B63H *9/04*
U.S. Cl. 114—102 **8 Claims**

1. A sail rig having a mast pole and a boom,

means on said mast pole pivotally connecting it to a vehicle to rotate about an axis,

said mast pole having a vertically extending first part connected to said vehicle,

and a generally forwardly extending second part fixed to said first part,

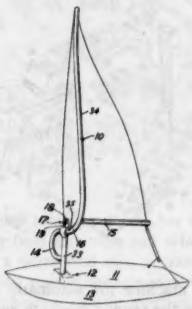
said second part curving from a generally horizontally extending direction upwardly and terminating at a mast head,

a boom pivotally connected to said mast pole at the pivot axis thereof to swing about said axis,

a sail,

connecting means connecting said sail to said boom and to said mast pole,

said mast pole being tubular,



said connecting means comprising groove means in one side thereof extending continuously from the top to the bottom of the second part,

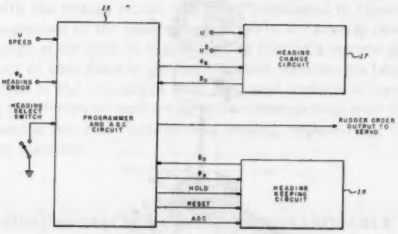
said sail having a bead thereon extending substantially the length of one side thereof slidably received in said groove.

4,074,648

ADAPTIVE AUTOPILOT FOR MARINE VESSELS

Robert E. Reid, Barboursville, and Charles R. Wesner, Crozet, both of Va., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,637
Int. Cl.[2] B63H *25/04*
U.S. Cl. 114—144 RE **10 Claims**



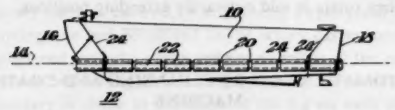
1. An adaptive autopilot for ships comprising means to receive signals indicative of the ship's speed and heading error, heading keeping means for producing a rudder error signal indicative of desired rudder position when the error signal is below a selected threshold, heading change means for producing a rudder order signal when the error signal exceeds said threshold, means for selecting either the heading keeping or heading change means in accordance with the magnitude of the error signal, means for automatically adjusting the magnitude of the rudder order signal produced by the heading change means in accordance with changes in the ship's speed, and means for automatically adjusting the magnitude of the rudder order signal produced by the heading keeping means in accordance with changes in ship's speed heading error signal and rudder order signal.

4,074,649

ICE BARRIER FOR BOATS

Robert L. Stranahan, 2403 Limestone Road, Wilmington, Del. 19808

Filed May 4, 1977, Ser. No. 793,720
Int. Cl.[2] B63B 59/02
U.S. Cl. 114—219 10 Claims



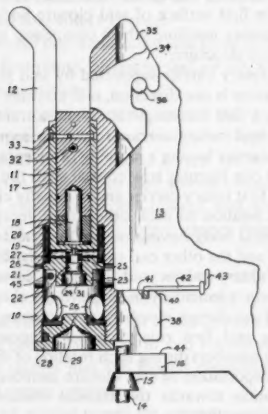
1. An ice barrier for permitting the wet storage of boats during freezing weather comprising, in combination:
a member formed of a compressible material and having first and second opposite faces;
said first face being generally flat and adapted to contact a portion of a boat at its waterline;
said second face defining a horizontally disposed, notched region; and
means to secure said member to a boat with said notched region at said waterline.

4,074,650

EXPENDABLE LIGHT-WEIGHT MINESWEEPING CUTTER

Richard C. Dyjak, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 12, 1963, Ser. No. 272,810
Int. Cl.[2] B63B 9/00
U.S. Cl. 114—221 A 1 Claim



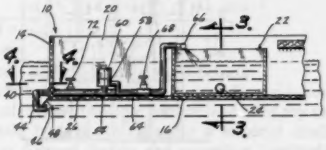
1. In an underwater mine cable cutter of the cartridge-chisel type adapted to be pulled forwardly through the water by a sweep line provided with a cutter stop
a stabilizing fin having a front edge adapted to lie along a sweep line,
an abutment formed on said fin for engaging a cutter stop,
a frame member having an axis,
said frame member having a sweep line-receiving recess parallel to said axis
means for detachably connecting said frame member to said fin with the front edge of said fin closing the entrance to said recess,
said connecting means including shearable means the shearing of which releases said frame from said fin,
the abutment on said fin being spaced in said axial direction from a portion of said frame member by a distance sufficient to permit the shearing of said shearable means and thereafter be engaged by said frame member to resist further recoil thereof, and
explosively driven cable cutting means so arranged in said frame member that recoil in the axial direction from a cable cutting explosion causes the shearing of said shearable means to release said frame member from said fin.

4,074,651

FORCED AERATING MEANS FOR INBOARD LIVE WELLS

Dell H. Arduser, Box 261, Osceola, Mo. 64776

Filed Aug. 4, 1976, Ser. No. 711,582
Int. Cl.[2] B63B 35/26
U.S. Cl. 114—255 6 Claims



1. In combination,
a boat,
at least one live well within said boat,
a water pipe means having a discharge end positioned within said boat adjacent said well for supplying water thereto and an intake end positioned outwardly of said boat below the water line thereof and extending forwardly relative to the direction of travel of said boat with said forwardly extending portion of said intake end pivotally mounted to permit it to pivotally move upwardly if it strikes an obstruction,
a water aerator means on said discharge end,
a pump means in said boat positioned externally of said well and connected to said water pipe means for selectively pumping water from outside said boat through said aerator means,
said water pipe means including a pump by-pass pipe such that the movement of said boat through the water will cause water to be directed into said intake end, through said by-pass pipe to said water aerator means,
and means for powering said pump means.

4,074,652

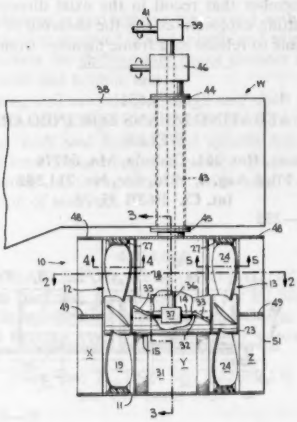
STEERING AND PROPULSION DEVICE FOR WATERCRAFT

William M. Jackson, 109 Hursey Ave., Pass Christian, Miss. 39571

Filed July 26, 1976, Ser. No. 708,426
Int. Cl.[2] B63H 5/14
U.S. Cl. 115—35 8 Claims

1. A two-stage axial fluid flow steering and propulsion device capable of being mounted on a water vessel, comprising, an impeller shaft, a pair of spaced impellers mounted on said shaft for rotation therewith, an annular housing surrounding said impellers and defining a tube through which fluid may flow upon rotation of said impellers, a shroud structure in the form of a venturi-type ring surrounding each of said impellers thereby defining three separate pressure regions of positive pressure ahead of one of said impellers which pulls the fluid when rotating in one direction, a negative pressure between said impellers and a negative pressure behind the other of said impellers which pushes the fluid when rotating in said one direction, radially extending fluid deflection baffles disposed outwardly of said impellers and extending outwardly of opposite ends of said annular housing for deflecting the fluid to flow toward said impellers and through said tube when said impellers are rotating in said one direction or in a direction opposite

thereof, said housing being mounted for rotation about an axis intersecting with and perpendicular to the impeller shaft axis, impeller shaft rotation means including a drive shaft having an



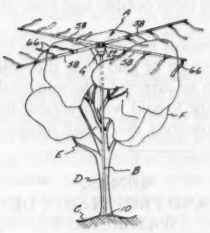
axis lying perpendicular to the axis of said impeller shaft, and means for rotating said housing, whereby the device is capable of a wide range of steering maneuvers during rotation of said housing.

4,074,653

BIRD FRIGHTENER

Carleton R. Pember, 27331 Silveradd Canyon Road, Orange, Calif. 92667

Filed Dec. 27, 1976, Ser. No. 754,274
Int. Cl.[2] G08B *15/00*
U.S. Cl. 116—22 A **5 Claims**



1. A bird frightener that may be removably disposed adjacent a tree or bush that has fruit thereon to prevent the latter being eaten by birds, said bird frightener including:

a. a pole that has first and second ends, said pole of such length that when said first end is embedded in ground adjacent said tree or bush that said pole extends upwardly through said foilage for said second second end to be disposed thereabove;

b. a prime mover mounted on said second end, said prime mover including a driven member that is slowly rotated, said driven member having a cavity of noncircular transverse cross section extending downwardly therein;

c. a first clutch member that includes a depending member of non-circular transverse cross section that slidably and snugly engages said cavity;

d. a second clutch member axially aligned with said first clutch member and resting thereon;

e. a head assembly secured to said second clutch member, said head assembly including a plurality of circumferentially spaced pivotally movable tubular members capable of being disposed in outwardly, upwardly and downwardly extending positions;

f. a plurality of arms that extend outwardly, from said tubular members;

g. a plurality of streamers secured to said arms; and

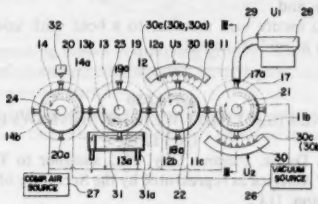
h. cam means on which said tubular members rest when said head rotates, with said cam means imparting periodic up and down movement to said tubular members and arms as they rotate in said outwardly extending positions.

4,074,654

AUTOMATIC CLOSURE CLEANSING AND COATING MACHINE

Yukihide Noguchi; Takeshi Nishimura; Jotaro Kishimoto, and Yoshio Nishida, all of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 18, 1976, Ser. No. 743,213
Claims priority, application Japan, Feb. 6, 1976, 51-12476
Int. Cl.[2] B05C *3/10*; B08B *3/02*
U.S. Cl. 118—73 **8 Claims**



1. For cleaning closure members each comprised of a closure body having first and second surfaces opposed to each other and a leg extending outwardly from and substantially at right angles to the first surface of said closure body, an automatic closure cleansing machine which comprises, in combination:

a. a support structure;

b. a first rotary carrier supported by said support structure for rotation in one direction, said machine having a supply station, a first cleaning station and a transfer station past which said rotary carrier rotates in sequence, said first rotary carrier having a plurality of receptacles arranged in at least one circular row coaxial with the axis of rotation of said first rotary carrier and in equally circumferentially spaced relation to each other, each receptacle having a cylindrical body having one end connected to the rotary carrier and the other end spaced a distance from a surface of the rotary carrier and having an inwardly extending recess complementary in shape to the shape of the leg on each of the closure members, at least some of said receptacles on said first rotary carrier successively receiving closure members during each rotation of the rotary carrier for transportation of said closure members from the supply station towards the transfer station past the first cleansing station;

c. means including a supply chute and disposed adjacent the first rotary carrier at the supply station for accommodating a batch of the closure members and for aligning the closure members in a predetermined posture and then feeding said closure members into said receptacles on said first rotary carrier through said chute;

d. a second rotary carrier supported by said support structure for rotation in a direction opposite to the direction of rotation of said first rotary carrier, said second rotary carrier being positioned adjacent the first rotary carrier and being movable past the transfer station, said machine having a second cleansing station and a release station past which said second rotary carrier rotates sequentially following rotation past said transfer station during each rotation thereof, said second rotary carrier having a plurality of receptacles arranged in at least one circular row

coaxial with the axis of rotation of the second rotary carrier, said receptacles on said second rotary carrier being so spaced equally from each other that, during rotation of said first and second rotary carriers in the opposite directions to each other, the receptacles on said first and second rotary carriers can be successively aligned with the receptacles on the other of said first and second rotary carriers, each receptacle having a cylindrical body having one end connected to the rotary carrier and the other end spaced a distance from a surface of the rotary carrier and having an inwardly extending recess complementary in shape to the shape of the leg on each of the closure members, at least some of said receptacles on said second rotary carrier, as they are moved past said transfer station during rotation of said second rotary carrier, receiving the closure members from the corresponding receptacles on said first rotary carrier and, thereafter, transporting said closure towards the release station;

e. first means operatively coupled to said first rotary carrier for continuously driving said first rotary carrier in said one direction;

f. second means operatively coupled to said second rotary carrier for driving said second rotary carrier in said direction opposite to the direction of rotation of the first rotary carrier in synchronism with said first rotary carrier;

g. a vacuum supplying means;

h. an air supplying means;

i. first means for communicating said some of said receptacles on said first rotary carrier to said vacuum supplying means during rotation of said first rotary carrier from said supply station at least past said first cleansing station for sucking closure members toward said some of said receptacles on said first rotary carrier;

j. second means for communicating said some of the receptacles on the first rotary carrier to said air supplying means at said transfer station;

k. third means for communicating some of the receptacles on the second rotary carrier to said vacuum supplying means during rotation of said second rotary carrier from said transfer station at least past said second cleansing station for sucking closure members toward said some of said receptacles on said second rotary carrier from said first rotary carrier;

l. fourth means for communicating said some of the receptacles on the second rotary carrier to said air supplying means at said release station for releasing closure members which have been transported to said release station from the transfer station past the second cleansing station by said second rotary carrier;

m. said first and second means for communicating and said third and fourth means for communicating being operatively associated and operated simultaneously during each rotation of the first and second rotary carriers, respectively;

n. a first cleansing liquid applicator positioned adjacent the first rotary carrier at the first cleansing station for spraying a cleansing liquid under pressure against one of the surfaces of the closure body of each of the closure members; and

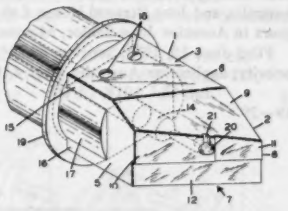
o. a second cleansing liquid applicator positioned adjacent the second rotary carrier at the second cleansing station for spraying a cleansing liquid under pressure against the other of the surfaces of the closure body of each of the closure members.

4,074,655

EDGE COATING APPLICATOR NOZZLE

William G. Gross, York; Henry A. Long, Jr., Columbia, and John R. Yamshak, Lancaster, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Oct. 18, 1976, Ser. No. 733,102
Int. Cl.[2] B05C *3/02*
U.S. Cl. 118—410 **8 Claims**



1. A one-piece applicator nozzle comprising:

(a) a body member having a flat bottom surface, side surfaces perpendicular to said bottom surface, and a flat top surface portion, said body further having a material discharge passageway formed therein and extending longitudinally through a portion thereof;

(b) a nose portion on said body member, said nose portion having a front face with a coating material reservoir extending inwardly therefrom in communication with said material discharge passageway, and a top surface extending upwardly at an angle from the face of said nose portion to the top surface portion of said body member, said front face of said nose portion further having a material discharge outlet formed therein and extending downwardly from the top surface of the nose portion in communication with said reservoir; and

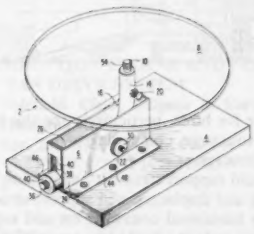
(c) means integral with said body member for placing said material discharge passageway in communication with a material supply source.

4,074,656

CAKE DECORATOR'S TURNTABLE

Ray Haapala, Rte. 3, Box 76, Dassel, Minn. 55325

Filed Sept. 22, 1976, Ser. No. 725,647
Int. Cl.[2] B05C *11/14*
U.S. Cl. 118—502 **4 Claims**



1. A base

a chassis on said base,

a rigid crank having two arms extending from a juncture thereof at substantially right angles to one another,

pivot means supporting the juncture of the crank arms on said chassis for rotation about a horizontal pivotal axis wherein one of said crank arms extends generally upwardly from said pivot means and the other arm extends generally laterally from said pivot means,

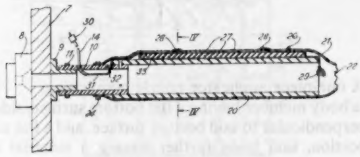
a normally horizontal disc-shape platform having a central spike projecting upwardly therefrom, bearing means rotatably mounting said platform on the free end of said one arm for rotation about the longitudinal axis of said one

arm, and manually engageable means on the free end of said other arm, whereby said crank may be swung about said horizontal axis so as to tip said platform from the horizontal.

4,074,657
LURE

Ascanius John Senior, 1 Lavoni Street, Mosman, New South Wales, Australia, and John Bernard Heaps, Lakemba, Australia, assignors to Ascanius John Senior, Mosman, Australia

Filed June 15, 1976, Ser. No. 696,441
Claims priority, application Australia, July 4, 1975, 2234/75
Int. Cl.[2] A01K *15/00*
U.S. Cl. 119—29 **10 Claims**

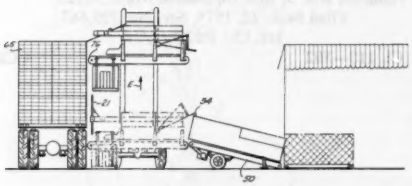


1. Greyhound conditioning apparatus, comprising a lure, an electrode on said lure, an electrical power source, and circuit means energised by said source and connected to said electrode whereby a greyhound attacking the lure receives from said electrode an electrical "fight-back" stimulus of sufficiently short time duration not to shock or frighten a greyhound but rather to stimulate the greyhound to attack the lure in the belief that said lure is alive.

4,074,658
TURKEY LOADER

Shmuel Mermelstein, 63-61 Yellowstone Blvd., Forrest Hills, N.Y. 11375, and Nathan Klugmann, Kibbutz Nachshon, Israel

Filed Sept. 10, 1976, Ser. No. 721,978
Int. Cl.[2] A01K *29/00*
U.S. Cl. 119—82 **6 Claims**



1. A loader for birds, particularly for the transfer of birds from a flock to a cage, comprising:

a support structure;

means on said support structure engageable by a forklift for elevating and displacing said support structure;

a generally horizontal conveyor on said support structure, said conveyor being flanked by a pair of guides and having an entry end and a discharge end;

an inlet gate at said entry end displaceable to permit birds to pass onto said conveyor;

a discharge gate at said discharge end shiftable to permit birds to pass from said conveyor;

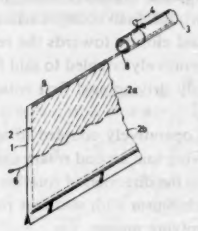
a platform suspended from said structure at said discharge end adapted to accommodate an operator for guiding said birds off the discharge end of said conveyor; and means including

a hydraulic system removably connected with said support structure for positioning said conveyor and including control means at said platform for operation by the operator of said hydraulic system for vertically moving said support structure, said discharge gate being mounted upon said structure so as to swing into an open position in which it is inclined downwardly and forwardly in the direction of movement of said conveyor to discharge said birds therefrom and said inlet gate being closed upon vertical movement of said support structure.

4,074,659
CATTLE DUSTING BAG

Warwick Mowbray, Beenleigh; Richard Hart, West Pennant Hills, and William Cavey, Kyle Bay, all of Australia, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 12, 1976, Ser. No. 731,155
Claims priority, application Australia, Oct. 15, 1975, 3580/75
Int. Cl.[2] A01K *29/00*
U.S. Cl. 119—159 **2 Claims**



1. A cattle dusting bag comprising

a. an outer bag of thermoplastic material open at its lower end.

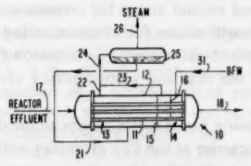
b. an inner bag consisting of a substantially rigid porous cloth, having a heavily sewn seam at its upper end, said inner bag being divided into an upper portion and a lower dispensing portion by readily removable transverse stitching, the said upper portion being lined or impregnated with an impervious material and containing the ectoparasiticidal dusting agent prior to use and

c. a slit metal pipe by means of which the dusting bag is to be suspended the heavily sewn seam of the inner bag within the upper end of the outer bag being received and retained with in the slit of the metal pipe.

4,074,660
WASTE HEAT RECOVERY FROM HIGH TEMPERATURE REACTION EFFLUENTS

Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Nov. 24, 1975, Ser. No. 634,409
Int. Cl.[2] F22B *1/02*
U.S. Cl. 122—32 **9 Claims**



1. A process for cooling a high temperature reaction effluent to increase heat recovery therefrom, comprising:

introducing the effluent at a temperature of from about 600° F to about 2000° F into the inlet end of the tubes of a shell and tube heat exchanger, said heat exchanger shell being divided into first and second completely separate and

distinct sections, said first section being at the inlet end of the exchanger whereby the effluent is introduced into the portion of the tubes in the first section and the second section being at the outlet end of the exchanger whereby the effluent is withdrawn from the portion of the tubes in the second section, each tube being a continuous tube which extends through the first and second section;

introducing and passing a first stream of water through the first section of the shell in an indirect heat transfer relationship with the effluent in the tubes to cool said effluent and heat said first stream of water; said first stream of water being at a pressure to generate steam therefrom as a result of said heating in the first section, said first stream being at a pressure of from about 80 to about 500 psig;

introducing and passing a second stream of water through the second section of the shell in an indirect heat transfer relationship with effluent in the tubes to further cool said effluent and heat said second stream of water;

withdrawing said second stream of water from the heat exchanger and re-introducing said withdrawn second stream into the heat exchanger in said first stream; and

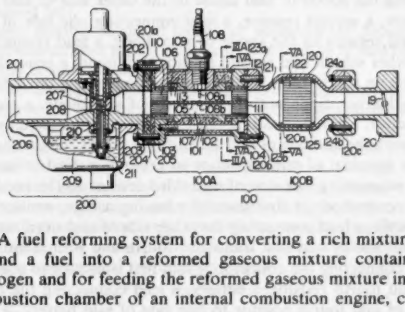
withdrawing cooled effluent from the outlet end of said tubes, said cooled effluent being at a temperature of from about 200° F to about 300° F.

4,074,661

FUEL REFORMING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Masaaki Noguchi, Nagoya; Tsuchio Bunda, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 11, 1976, Ser. No. 657,289
Claims priority, application Japan, Feb. 14, 1975, 50-19229
Int. Cl.[2] F02B *43/08*
U.S. Cl. 123—3 **10 Claims**



1. A fuel reforming system for converting a rich mixture of air and a fuel into a reformed gaseous mixture containing hydrogen and for feeding the reformed gaseous mixture into a combustion chamber of an internal combustion engine, comprising:

an air-valve type carburetor for producing a heterogeneous rich mixture of air and fuel;

means disposed downstream of said carburetor for defining an intake passage leading to a combustion chamber of an internal combustion engine;

means disposed in said intake passage directly downstream of said carburetor for dividing a part of said intake passage into first and a second sub-passages to introduce a relatively lean part of said heterogeneous rich mixture into said first sub-passage and introduce a relatively rich part of said heterogeneous rich mixture into said second sub-passage;

igniting means extending into said first sub-passage for igniting and burning said relatively lean part of said mixture to produce heat in said first sub-passage, said heat being transferred to said second sub-passage to heat said relatively rich part of said mixture flowing therethrough;

the burned gas from said first sub-passage and said relatively rich part of said mixture from said second sub-passage being mixed together downstream of said dividing means to facilitate atomization of said mixture;

catalyst means disposed in said intake passage downstream of said dividing means for converting the heated and atomized mixture into reformed gaseous mixture; and

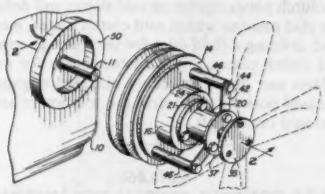
a throttle valve disposed in said intake passage downstream of said catalyst means for varying the cross-sectional area of said intake passage.

4,074,662

COOLING FAN CONTROL

Kenneth K. Estes, 8248 E. Glenrosa Ave., Scottsdale, Ariz. 85251

Filed Dec. 29, 1976, Ser. No. 755,230
Int. Cl.[2] F16D *27/10, 43/25;* **F01P** *7/02*
U.S. Cl. 123—41.12 **8 Claims**



1. For use with a liquid cooled motor vehicle engine having a water pump with a shaft connected to a water pump drive pulley assembly, a cooling fan control system including in combination:

an extender element attached to the water pump drive pulley assembly for rotation therewith;

a cooling fan mounting hub;

bearing means for rotationally free mounting said fan mounting hub on said extender element;

clutch face means carried by the pulley assembly;

an armature movable mounted to said fan mounting hub by resilient biasing means for permitting movement of said armature in a direction parallel to the water pump shaft, said biasing means urging said armature away from said clutch face means;

an electromagnet coil fixedly mounted to the engine adjacent the water pump drive pulley assembly;

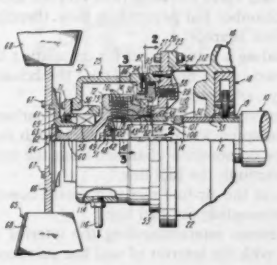
switching means coupling said coil with a source of electrical current for energizing said coil to create a magnetic force to attract said armature for frictional engagement with said clutch face means, thereby rotating said cooling fan mounting hub with said extender element.

4,074,663

INTERNAL COMBUSTION ENGINE AND COOLING FAN DRIVE SYSTEM

Halsey W. Cory, Fairfield, Ohio, assignor to Force Control Industries, Inc., Hamilton, Ohio

Filed Apr. 23, 1975, Ser. No. 570,646
Int. Cl.[2] F01P *7/02;* **F16D** *13/60*
U.S. Cl. 123—41.12 **7 Claims**



1. In an internal combustion engine including a crankshaft

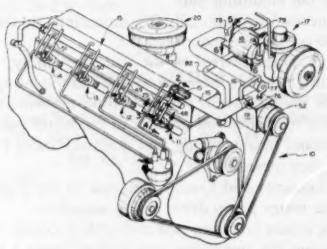
having a projecting end portion and a rotary fan for cooling the engine, an improved system for driving said fan with said crankshaft, comprising a set of interfitting annular clutch plates and annular clutch discs, a removable sleeve mounted on said end portion of said crankshaft in surrounding relation and supporting said clutch plates for rotation therewith, means for retaining said sleeve on said end portion of said crankshaft, a housing supported by said engine and enclosing said clutch plates and clutch discs, an output shaft supporting said fan, bearing means retained by said housing and supporting said output shaft and said fan for rotation on an axis aligned with the axis of said crankshaft, means on said output shaft for supporting said clutch discs for rotation therewith, said sleeve having means defining at least one fluid passage extending generally axially along said end portion of said crankshaft and into said clutch plates, means on said sleeve and defining a fluid outlet for said passage within said clutch plates, means on said sleeve and defining a fluid inlet for said passage spaced axially from said clutch plates, and actuator means for moving said clutch plates and discs between a clamped engaged position and a released position to control the rotation of said fan with respect to said crankshaft.

4,074,664

FUEL CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Ralph T. Rollins, Holladay, Utah, assignor to Astron Innovations, Inc., Salt Lake City, Utah

Filed Feb. 12, 1976, Ser. No. 657,352
Int. Cl.[2] F02M *31/10*
U.S. Cl. 123—75 B **5 Claims**



1. A fuel control system for internal combustion engines comprising

a stratified charge igniter having a housing with one end adapted to be screwed into the spark plug opening of an internal combustion engine, a bore through the housing, a secondary combustion chamber in the bore at the other end of the housing, a spark plug opening through the housing and opening into the secondary combustion chamber, a spark plug in the spark plug opening;

a fuel line adapter having a passage therethrough extending through the housing into the secondary combustion chamber, and a pressure responsive valve in the fuel line adapter, said valve allowing flow into the secondary combustion chamber but preventing flow therefrom through the fuel line adapter;

means including a water jacket for circulating liquid around at least part of the housing to cool the housing;

a secondary carburetor;

a fuel line interconnecting said secondary carburetor and the fuel line adapter, whereby an air-fuel mix is supplied to the secondary combustion chamber from the secondary carburetor through the fuel line;

means to heat the air-fuel mix said means comprising

a line surrounding the fuel line,

conduit means interconnecting the interior of the water jacket with the interior of said line surrounding the fuel line,

a pre-heater unit in the fuel line, said pre-heater unit including heated baffle means through which the air-fuel mix is passed, and

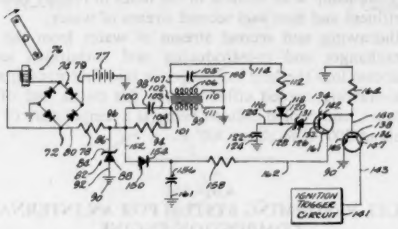
means coupling the interior of the water jacket to the pre-heating means, whereby liquid cooling the igniter is used to heat the baffle means.

4,074,665

ENGINE SPEED LIMITER

Bruce L. Patis, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Division of Ser. No. 831,007, June 6, 1969, abandoned. This application Oct. 19, 1971, Ser. No. 190,651
Int. Cl.[2] F02D *11/10*; F02P *1/00*
U.S. Cl. 123—102 **5 Claims**



1. Apparatus for interrupting ignition operation, said apparatus comprising an ignition trigger circuit, a first capacitor, a first resistor, a lead connecting one terminal of said first capacitor with a voltage generating device, a lead connecting the other terminal of said first capacitor with one side of said first resistor, a diode having an anode and a cathode, a lead connecting the anode of said diode to the other side of said first resistor, a second resistor, a lead connecting one side of said second resistor to the anode of said diode, a lead connecting the other side of said second resistor to ground, a zener diode having an anode and a cathode, a lead connecting the cathode of said zener diode with the cathode of said diode, a second capacitor, a lead connecting one terminal of said second capacitor with the cathode of said zener diode, a lead connecting the other terminal of said capacitor to ground, a third resistor, a lead connecting one side of said third resistor to the anode of said zener diode, a first transistor having a base, emitter and collector, a lead connecting the other side of said third resistor to the base of said first transistor, fourth and fifth resistors, a lead connecting the collector of said first transistor to one side of said fourth resistor, a battery, a lead connecting the other side of said fourth resistor to one side of said battery, a lead connecting the other side of said battery to ground, a lead connecting the emitter of said first transistor to said fifth resistor, a lead connecting the other side of said fifth resistor to ground, a second transistor having a base, a collector and an emitter, a lead connecting said base of said second transistor with said emitter of said first transistor, a lead connecting said emitter of said second transistor to ground, and a lead connecting said collector of said second transistor to said ignition trigger circuit.

4,074,666

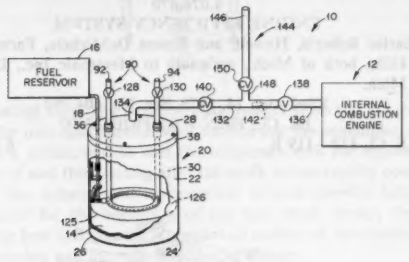
CARBURETION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Sherman L. Pierce, P.O. Box 81, and Harold D. Pierce, P.O. Box 73, both of Birchwood, Tenn. 37308

Filed Sept. 17, 1975, Ser. No. 614,124
Int. Cl.[2] F02M *17/22*
U.S. Cl. 123—134 **5 Claims**

1. In combination with an internal combustion engine having a variable volume combustion chamber, a carburetion systems comprising:

reservoir means containing a quantity of liquid fuel,
closed container means defining a chamber,
first conduit means providing fluid communication between said reservoir means and said container means,
means, comprising a vertically adjustable bracket frictionally engaging said first conduit and a float valve secured to the lower end of said first conduit, regulating the flow of fuel from said reservoir to said chamber to that quantity of liquid fuel that establishes an adjustable predetermined level of liquid fuel within said chamber,
air intake means providing fluid communication between ambient atmosphere external to said chamber and said chamber, and including diffuser means disposed within said chamber adjacent and above the surface of said fuel, said diffuser means being provided with a plurality of ports on that portion thereof that faces said surface of said liquid fuel whereby air passing through said air intake



means is diffused into said chamber adjacent the surface of said fuel and forms a combustible gaseous mixture with said fuel above the surface of said fuel in said chamber and whereby diffused air does not pass upwardly through liquid fuel,
sealed, slidably mounted means for adjusting the proximity of said diffuser means relative to said surface of said liquid fuel in said container means,
further conduit means connecting said chamber at a location above the level of said liquid fuel therein to said combustion chamber,
check valve means disposed in said further conduit means and establishing unidirectional fluid flow through said conduit means in the direction toward said internal combustion engine and away from said chamber, and
throttle means selectively operable to regulate the flow of combustible mixture through said further conduit means into said internal combustion engine.

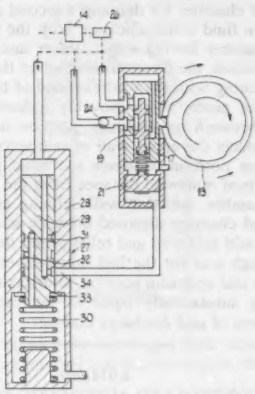
4,074,667

LIQUID FUEL INJECTION PUMPING APPARATUS

Robert Thomas John Skinner, High Wycombe, England, assignor to C.A.V. Limited, Birmingham, England

Continuation of Ser. No. 595,426, July 14, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 735,524
Claims priority, application United Kingdom, July 19, 1974, 32019/74
Int. Cl.² F02M *59/20*
U.S. Cl. 123—139 AQ **3 Claims**

1. A liquid fuel injection pumping apparatus for supplying fuel to an internal combustion engine comprising an injection pump adapted to be driven in timed relationship with an associated engine, a fluid pressure operable member for controlling the timing of delivery of fuel to the associated engine, means for generating a fluid pressure responsive to an operating characteristic of the associated engine, conduit means through which said pressure is applied to said member, resilient means loading said member against the action of the fluid pressure, a pressure responsive piston forming an abutment for said resilient means, said piston being movable from a first to a second position when pressure is applied thereto as to vary the force exerted by said resilient means on said member, a pressure responsive valve for controlling the application of pressure to said piston, said valve comprising a valve cylinder, a valve element movable in said cylinder, a port in the wall of said valve cylinder, further conduit means for communicating the pressure at said port to said pressure responsive piston, resilient means biasing said valve element to one end of said cylinder, a pair of axially spaced grooves on said valve element, a pair of passages through which said grooves communicate with the



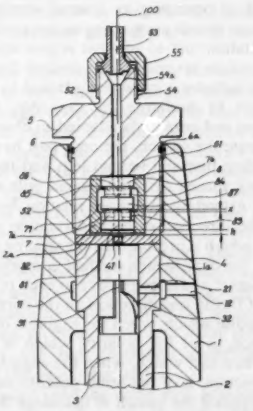
opposite ends of the valve cylinder respectively, passage means communicating the other end of said valve cylinder with the means generating said fluid pressure so that the valve element moves in response to variations in said fluid pressure, and further passage means through which said one end of the cylinder communicates with a drain, said valve element acting depending on its position, to place said port in communication with one or the other end of said valve cylinder.

4,074,668

DISCHARGE VALVE FOR INJECTION PUMPS OF INTERNAL COMBUSTION ENGINES

Jaromir Indra, Brno, Czechoslovakia, assignor to Vysoke uceni technicke, Brno, Czechoslovakia

Filed Feb. 9, 1976, Ser. No. 656,651
Claims priority, application Czechoslovakia, Feb. 14, 1975, 969/75
Int. Cl.² F02M *59/02*
U.S. Cl. 123—139 AF **8 Claims**



1. A piston-type injection pump for supplying fuel through a discharge conduit to an injector of an internal combustion

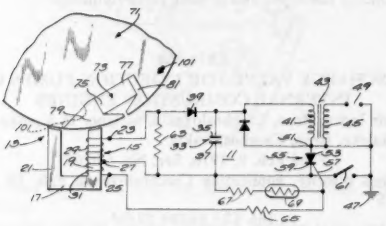
engine, the pump comprising, in combination a cylinder having a fuel supply port in a wall thereof, a piston supported for rotation and reciprocation in the cylinder to effect the pressure and suction strokes of the pump, the piston having a profiled peripheral edge cooperable with the fuel supply port in the cylinder during the piston movement for effecting a flow of fuel through the fuel supply port, the space between the piston and the associated end of the cylinder defining a first chamber; means associated with the cylinder and disposed downstream of the first chamber for defining a second chamber separated from but in fluid communication with the first chamber, said second chamber having upper, lower and side walls, a discharge channel, the downstream end of the second chamber communicating with the upstream end of the discharge channel; a relief piston being movably mounted in said second chamber between an upstream position in which the relief piston contacts the upper wall of said second chamber and a downstream position in which the relief piston is spaced a predetermined minimum distance from the lower wall of said second chamber, said side wall defining an annular space in said second chamber disposed between said relief piston and side wall, said side wall and relief piston defining a maximum flow-through area for the fuel therebetween when said relief piston is in said upstream position, said maximum flow-through area being substantially equal to the cross-sectional flow-through area of said discharge channel.

4,074,669

ROTOR CONTROLLED AUTOMATIC SPARK ADVANCE

David T. Cavil, Menomonee Falls, Wis.; Einar T. Hansen, Galesburg, Ill., and Henry J. Schmidt, Menomonee Falls, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 551,087, Feb. 20, 1975, abandoned.
This application Dec. 29, 1976, Ser. No. 755,179
Int. Cl.[2] F02D *3/06*
U.S. Cl. 123—148 CC **1 Claim**



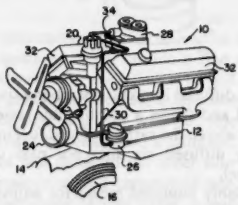
1. A method of operating an internal combustion engine ignition system to permit normal engine operation in a desired direction of rotation and to prevent engine operation in the direction of rotation reverse to the desired direction, which ignition system includes a capacitor adapted to be charged, a switch operative to discharge the capacitor, and relatively rotatable magnet and core parts adapted to charge the capacitor and to operate the switch, the core part having thereon a coil and including first and second legs and the magnet part having arcuately spaced first and second pole shoes with the first pole shoe extending in spaced relation from the second pole shoe in the direction of desired rotation and having an arcuate length which is greater than the spacing of the first and second legs of the core, which method comprises the steps of rotating the magnet and core relative to each other to initially cause inflow of flux in one direction on the core to produce in the coil a first pulse which, when the engine is operating in the desired direction, is of the polarity which is ineffective to operate the switch and which, when the engine is operated in the reverse direction, is of the other polarity and of sufficient magnitude to operate the switch to discharge the capacitor so far in advance of top dead center so as to preclude continued reverse engine rotation, to thereafter cause outflow of flux in the opposite direction from the core to produce in the coil a second pulse which, when the engine is operating in the desired direction, is of the opposite polarity and of insufficient magnitude to operate the switch to cause discharge of the capacitor when the engine is operating at slow speed and of sufficient magnitude to operate the switch to discharge the capacitor when the engine is operating at high speed, to thereafter cause inflow of flux into the core so as to produce in the coil a third pulse which, when the engine is operating in the desired direction, is of the opposite polarity and is effective to operate the switch to discharge the capacitor when the engine is operating at slow speed, and to thereafter cause reversal of flux flow so as to produce in the coil a fourth pulse which, when the engine is operating in the desired direction, is of the polarity which is ineffective to operate the switch and which can be employed to charge the capacitor.

4,074,670

ENGINE EFFICIENCY SYSTEM

Charles Roberts, Howell, and Ernest DeMichele, Farmington Hills, both of Mich., assignors to Mectronic Inc., Detroit, Mich.

Filed Aug. 14, 1975, Ser. No. 604,792
Int. Cl.[2] F02N *7/00;* **F02B** *77/00*
U.S. Cl. 123—119 E **6 Claims**



1. In combination with an internal combustion engine having a fuel line and an electrical system including means generating an electrical induction field, an engine efficiency device comprising:

a pair of closely adjacent electrically conductive coils disposed on substantially parallel axes and located within said induction field, said coils comprising windings having their ends connected with each other, and

means mounting said device adjacent said fuel line, said means comprising a wire member electrically insulated from said coils.

4,074,671

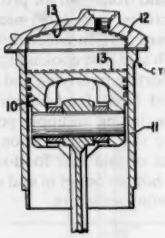
THIN AND LOW SPECIFIC HEAT CERAMIC COATING AND METHOD FOR INCREASING OPERATING EFFICIENCY OF INTERNAL COMBUSTION ENGINES

Simo A. O. Pennila, 66B River Bend Road, Stratford, Conn. 06497

Continuation of Ser. No. 519,664, Oct. 31, 1974, abandoned.
This application July 26, 1976, Ser. No. 708,838
Int. Cl.[2] F02B *23/00;* **F16J** *1/04*
U.S. Cl. 123—191 A **2 Claims**

1. An internal combustion engine with a cycle including a compression stroke, a work stroke and an exhaust stroke, said engine having a coated internal wall surface of the combustion chamber thereof, said internal wall surface having a thin coating thereon of ceramic material, the exposed surface of said coating being able to increase and decrease its temperature very rapidly in response to temperature changes in the combustion chamber during said strokes, said coating having a thickness from 0.2 to 1 mil, said ceramic material forming said coating having a specific heat of less than 0.12 BTU/lb/° F at

a temperature between 1200° and 2000° F., and said ceramic material also having a thermal conductivity of less than 11 BTU/HR/FT/° F at a temperature between 1200 and 2000° F. so that the temperature of the exposed surface of said thin coating during the work stroke is rapidly raised to a temperature close to the temperature of the hot gas in the combustion chamber, whereby due to the momentarily smaller temperature differences between the hot gas and the exposed surface of



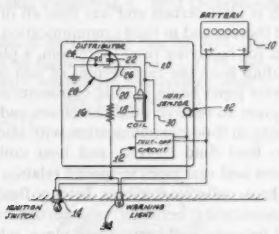
said coating there is a reduced heat transfer from the hot gas inwardly into said internal wall surface for the remainder of the work stroke, and so that the temperature of the exposed surface of said thin coating after the work stroke rapidly cools during the exhaust and compression strokes thereby being again cool for the beginning of the next work stroke, thus reducing heat loss into the internal wall surface of the combustion chamber and increasing engine efficiency.

4,074,672

SHUTOFF APPARATUS FOR INTERNAL COMBUSTION ENGINES

Donn LaDue, Hollywood; Robert J. Winchurch, and Gary R. Scaife, both of Los Angeles, all of Calif., assignors to S & S Research and Electronics, Tarzana, Calif.

Filed Jan. 23, 1976, Ser. No. 651,850
Int. Cl.[2] F02B *77/08*
U.S. Cl. 123—198 DC **32 Claims**



16. A method of shunting an induction coil in an ignition system of an internal combustion engine, said method comprising:

closing a normally open switch in the ignition circuit, said switch providing a path to ground,

delaying the voltage buildup a predetermined amount after said switch is closed,

supplying the built up delayed voltage to a biased means,

supplying reduced voltage from the biased means to fire a gated switch in series with said normally open switch,

firing the gated switch to actuate means to close a switch operated by said last means, and

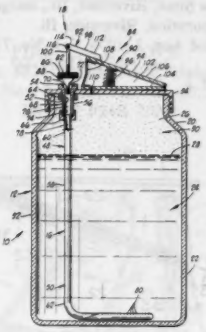
supplying negative voltage through the closed normally open switch and through the last means closed switch to the primary circuit of the induction coil to shunt the coil.

4,074,673

FLUID VAPOR INJECTOR

Jack L. Rushing, 5006 S. Blackwelder, Oklahoma City, Okla. 73119

Filed July 19, 1976, Ser. No. 706,750
Int. Cl.[2] F02D *19/00*; F02M *17/22*
U.S. Cl. 123—198 A **2 Claims**



1. A fluid vapor injector for injecting a fluid vapor into the intake manifold of an internal combustion engine, the injector comprising:

a reservoir for retaining a quantity of the fluid, the reservoir having an upper end, a lower end, and a vapor chamber defined therein generally between the upper level of the fluid and the upper end of the reservoir;

a fluid vapor conduit having one portion connected to the vapor chamber and another portion connected to the intake manifold, the fluid vapor conduit providing fluid communication between the vapor chamber and the intake manifold;

an aerator having an upper end extending through the upper end of the reservoir and a foraminous portion disposed in the fluid, the aerator providing fluid communication between the upper end thereof and the foraminous portion thereof; and

a valve assembly comprising:

a valve seat formed in the upper end of the aerator;

a bellows disposed generally above, and connected to, the upper end of the reservoir, the bellows comprising:

a base member connected to the upper end of the reservoir;

a hinged member pivotally connected to the base member, the hinged member being movable in one direction generally away from the base member and in one other direction generally toward the base member; and

a resilient diaphragm sealingly connected between the base member and the hinged member, the resilient diaphragm cooperating with the base member and the hinged member to define the interior of the bellows;

a biasing spring disposed in the interior of the bellows between the base member and the hinged member, the biasing spring biasing the hinged member in the one direction generally away from the base member;

means providing fluid communication between the interior of the bellows and the vapor chamber;

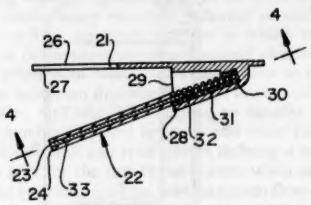
an actuator rod having a first end connected to the hinged member and a second end extending over the valve seat, the actuator rod moving with the hinged member; and

a valve stem pivotally connected to the second end of the actuator rod and depending generally downwardly toward the valve seat; and

a valve threaded onto the valve stem adjacent to and vertically above the valve seat, the valve moving with the actuator rod toward seating engagement with the valve seat as the hinged member moves toward the base member

and away from seating engagement with the valve seat as the hinged member moves away from the base member, the position of the valve with respect to the valve seat determining the rate of flow of air through the aerator.

4,074,674
ARROW REST
Miroslav Andrew Simo, Riverside, Ill., assignor to New Archery Products Corporation, Riverside, Ill.
Filed Aug. 2, 1976, Ser. No. 710,647
Int. Cl.[2] F41D *11/00*
U.S. Cl. 124—41 A **19 Claims**



1. An arrow rest for attachment to an archery bow comprising:

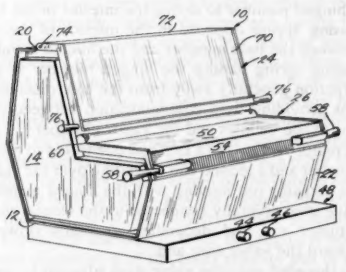
mounting means to secure said arrow rest in desired position on a first side of a bow adjacent the shaft of an arrow when in position to be shot from a bow;

spring means extending outwardly from said first side of a bow when said arrow rest is attached to a bow, said spring means having a first end in fixed relation to said mounting means and the opposite second end movable means and the opposite second end movable in a first plane generally parallel to the plane of a bow and in a second plane generally at right angles to said first plane;

arrow support means having a first end in fixed relation to said second end of said spring means an an opposite second end adapted to provide the complete support to an arrow shaft, freely resting on the top thereof, in the vicinity of a bow; and

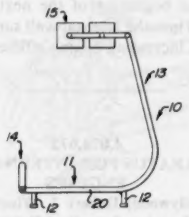
spring housing means immovably affixed to said mounting means for securement of said first end of said spring means and for providing movement restriction to said spring means.

4,074,675
COOKING DEVICE
Donald E. Dailey, Evansville, Ind., assignor to Arkla Industries, Inc., Evansville, Ind.
Filed Nov. 19, 1975, Ser. No. 633,393
Int. Cl.[2] A47J *37/00*
U.S. Cl. 126—41 R **11 Claims**



1. A cooking device comprising a hollow casing having top, bottom side, rear and front walls, said casing defining a first cooking space located in the lower front portion of the casing and defining a second cooking space disposed above and rearwardly of said first space and in communication with said front space, a front horizontal food-supporting structure disposed in said first space, a heat source disposed in said first cooking space directly below said front food-supporting structure and generally coextensive therewith, a rear horizontal food-supporting structure disposed in said second space at a location rearward and above said front structure, and door means forming at least a part of said front wall for providing access to said foodsupporting structures, said door means when closed including a lower forward portion which directs the heat and hot gases flowing through said first cooking space into said second space, said forward portion overlying and at least substantially coextensive with said front food-supporting structure, said door means further including an upper portion disposed rearwardly of and above said lower portion and in a generally upright plane in front of said rear food-supporting structure, and means defining a hot gas outlet in said casing located above said rear food-supporting structure.

4,074,676
WATER HEATER-FIREPLACE GRATE
Donald Richard Thomas, 206 Tule St., Montoursville, Pa. 17754
Filed May 28, 1976, Ser. No. 690,973
Int. Cl.[2] F24B *9/04*
U.S. Cl. 126—132 **6 Claims**

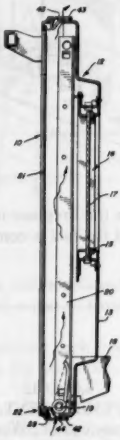


1. A water heater-fireplace grate comprising a plurality of forwardly and rearwardly extending generally horizontal bed pipes disposed in generally coplanar relation and providing a fuel supply bed, an ingress and egress pipe extending laterally across the forward ends of said bed pipes and in fluid communication with at least certain and less than all of the latter for feeding fluid thereto and in fluid communication with other of the bed pipes for receiving fluid therefrom, a plurality of rear pipes upstanding from the rear regions of said bed pipes, certain of said rear pipes being in fluid communication with said certain bed pipes to receive fluid therefrom and other of said rear pipes being in fluid communication with said other of said bed pipes to feed fluid thereto, and heat collection means extending from said rear pipes in spaced relation over said bed pipes, said heat collection means having fluid passageway means communicating between said certain rear pipes for passing fluid between said certain bed pipes, whereby fluid is adapted to be heated upon passage through said grate.

4,074,677
OVEN DOOR FULL FRONT VIEWING PANEL
Lawrence C. Lotz, Marion, Ohio, assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed June 16, 1976, Ser. No. 696,533
Int. Cl.[2] F23M *7/04*
U.S. Cl. 126—198 **17 Claims**

1. In an oven door provided with a liner having a window, and a front transparent panel having an edge portion, the improvement comprising: a frame having a rear portion adjacent the liner, a forward portion including a front flange defining a front window opening, and a retainer portion defining an inwardly opening recess rearwardly of said flange; retaining means for retaining the front panel in said frame including a

plurality of resilient bumpers at spaced portions of the frame each having a clamping portion engaging the rear surface of said front panel edge portion, a plurality of retaining clips associated one each with said plurality of bumpers, each clip including a front portion engaging said bumper clamping portion, a positioning portion received in said frame recess to position said clip front portion suitably to effect a preselected



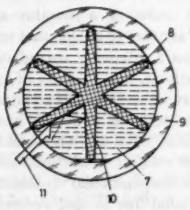
compression of said bumper clamping portion to clamp the front panel edge portion between said bumper clamping portion and said frame flange, and a securing portion; means for retaining said securing portion to prevent movement of said positioning portion inwardly from said frame recess and thereby effectively maintain the clamped mounting of the front panel to the frame; and securing means for removably securing said frame to said liner.

4,074,678

METHOD AND APPARATUS FOR HEATING A FLUID MEDIUM BY MEANS OF SOLAR ENERGY

Mario Posnansky, Pappelweg 4, 3072 Ostermundigen, Switzerland

Continuation-in-part of Ser. No. 537,677, Dec. 30, 1974, abandoned. This application June 17, 1976, Ser. No. 696,873
Claims priority, application Switzerland, Jan. 7, 1974, 113/74
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **6 Claims**



1. A receiver for concentrated solar radiation designed to heat a substantially transparent fluid, comprising

a tube permeable to solar light radiation,

an elongated body capable of absorbing solar radiation disposed within said tube,

said body including a series of vanes depending from a common axis, said vanes being disposed about said common axis in a star-like configuration, with inner edges thereof substantially adjacent to each other, so that adjoining vanes are separated by an angle of not more than 72°, and

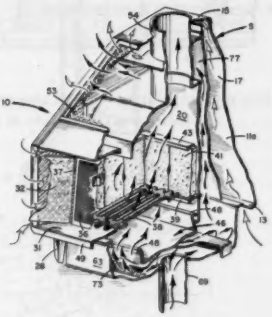
said body having an outer surface area at least twice as great as the inner surface area of said tube, so that light radiation impinging on the outer surface thereof is being repeatedly reflected by the surface thereof for substantially complete absorption thereby.

4,074,679

FIREPLACE STOVE

John Frank Jensen, 5220 Ponder, Boise, Idaho 83702

Filed Nov. 3, 1975, Ser. No. 628,371
Int. Cl.[2] F24B *7/00*
U.S. Cl. 126—121 **6 Claims**



1. A freestanding fireplace stove for heating a space within a building structure comprising, in combination, a housing having a sidewall including a bottom edge and an upper portion defining an interior, a combustion enclosure having a sidewall defining an interior and a bottom end portion disposed within the interior of said housing, with the outer surface of said combustion enclosure sidewall in spaced-apart relationship with the inner surface of said housing sidewall to define a clearance space for providing a passage for air to be heated, partition means disposed within said clearance space arranged substantially parallel to said housing sidewall and said combustion enclosure sidewall in spaced relationship with both said enclosure sidewall and said housing sidewall for the transfer of radiant heat from said combustion enclosure sidewall to the air flowing within said clearance space, means for supporting said housing and said combustion enclosure on a supporting surface within the building structure, fuel combustion means disposed within said combustion enclosure adjacent said combustion enclosure bottom end portion, an access opening in said combustion enclosure, closure means for closing said access opening, air inlet means for admitting air to be heated into said clearance space, air outlet means for discharging heated air from said clearance space into the space to be heated in the building structure, conduit means connected to said combustion enclosure and extending through said housing side wall upper portion for removing combustion gases from the interior of said combustion enclosure.

4,074,680

TELESCOPING HOOD FIREPLACE

Marvin Sexton Gooding, P.O. 36D, R.R. #4, Tiffin, Ohio 44883

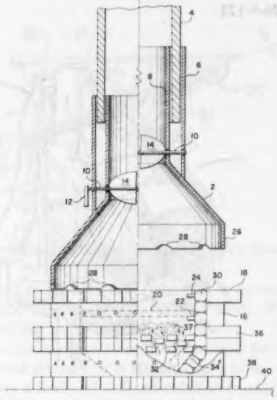
Filed July 9, 1976, Ser. No. 703,877
Int. Cl.[2] F24C *15/20*
U.S. Cl. 126—142 **16 Claims**

1. An improved fireplace comprising, in combination:

A. a fire support means operable for supporting a fire, including a fireplace base operable to be mounted upon a floor surface and air conduit means within said base for supplying ambient air to the bottom of said fireplace base, and;

B. a stationary smokepipe operable to be mounted above and in substantial vertical alignment with said fire support means, said stationary smokepipe extending downwardly to a point spaced above an upper platform on said fireplace base, and;

C. a telescoping hood means, positioned for vertical movement upon the downward extension of said stationary smokepipe, said hood means further comprising an inner stackpipe, concentrically within, and an outer stackpipe, concentrically outside, said smoke pipe with a downwardly open hood extending from said inner stackpipe,



wherein said hood is in sealing engagement with bottom surfaces of said inner and outer stackpipes and defines an annular space between the inner and outer stack pipes which space is substantially occupied by the stationary smoke pipe to define a labyrinth seal while it is operable to be adjustably positioned between said upper platform and said point spaced thereabove, wherein said downwardly opening hood further includes a lower edge operable for engaging the upper platform on said fireplace base, and said lower edge includes at least one aperture operable to allow room air to enter within said hood when said hood is lowered upon said upper platform.

4,074,681

FORCED AIR CIRCULATION HEATING UNIT FOR FIREPLACES

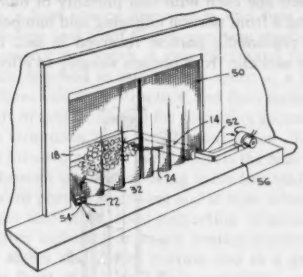
Isaac C. Whiteley, Redmond, Oreg., assignor to W-A Red Hot, Inc., Redmond, Oreg.

Filed Jan. 30, 1975, Ser. No. 545,402
Int. Cl.[2] F23H *13/00*
U.S. Cl. 126—164 **6 Claims**

1. A forced air circulation heating unit for installation in a fireplace comprising

a generally U-shaped conduit formed of an inlet leg having an end defining an inlet for said conduit, and outlet leg having an end defining an outlet for said conduit, and a base joining said inlet and outlet legs, said conduit being adapted to be

positioned on the floor of the fireplace with said inlet and outlet disposed on opposite sides of the fireplace; fan means for blowing air through said conduit from said inlet to said outlet such that air forced through said conduit is heated by fuel burned in the fireplace to supply a flow of hot air from said outlet of said conduit; and jet means including a first tube extending from said inlet leg for directing a first stream of air along said inlet leg at said conduit base and a second tube extending from said outlet leg for directing a second stream of air along said outlet leg at said conduit base, said first and second streams of air converging toward one another to provide air along said conduit base to maintain fuel on said conduit live whereby



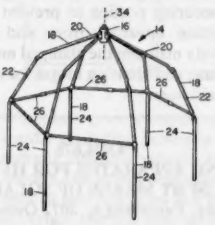
starting of a fire in the fireplace is aided, smoking of the fuel is reduced and the fuel is completely burned.

4,074,682

COLLAPSIBLE TENT FRAME

Chong J. Yoon, 145 Conestoga St., Windsor, Conn. 06095

Filed Nov. 8, 1976, Ser. No. 739,932
Int. Cl.[2] A45F *1/16*
U.S. Cl. 135—4 R **10 Claims**

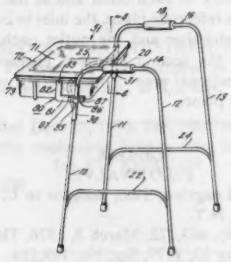


1. A tent frame readily changeable between a deployed condition and a compact collapsed condition, said tent frame comprising: a central hub having a central axis oriented vertically in said deployed condition of said frame, a plurality of legs spaced angularly of one another about said central axis, each of said legs including a plurality of sections pivotally connected to one another to enable said sections of each leg to be moved between a relatively spread condition and a relatively folded condition, said sections of each leg including an inboard section having an inboard end adjacent said hub and an outboard end remote from said hub, means connecting said inboard end of the inboard section of each of said legs to said hub for movement relative to said hub about a first pivot axis located in a plane perpendicular to said central axis and perpendicular to a radial line to said central axis, a central part carried by said hub and manually rotatable relative thereto, and a mechanism carried by said hub for simultaneously angularly moving all of said inboard sections of said legs relative to said hub about said first pivot axes in a deploying direction, in which said outboard ends of said inboard sections move away from said axis, in response to rotation of said central part in one direction and in a collapsing direction, in which said outboard ends of said inboard sections move toward said central axis, in response to rotation of said central part in the opposite direction.

4,074,683
WALKER WITH TRAY

Anthony J. Di Chiara, 10 St. Paul's Crescent, Garden City, N.Y. 11530

Filed June 7, 1976, Ser. No. 693,604
Int. Cl.[2] F16M 13/08; A45B 3/00
U.S. Cl. 135—67 3 Claims



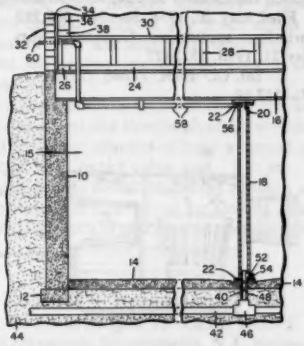
1. A walker for infirm individuals and a tray cradle therefor;
said walker comprising a pair of front legs and a pair of rear legs;
a horizontal bar connecting each front leg to a rear leg, the said front and rear leg and horizontal bar on each side forming a frame;
the said horizontal bar on each side providing a hand grip;
a crossbar interconnecting said front legs and forming said walker into a rectangular structure which may be entered from the rear by the infirm individual who may then grip said horizontal bars;
and a cradle supported between said front legs and extending substantially forward of said front legs and also extending above said crossbar;
said cradle being swingably supported between said front legs to stay level during use;
and a removable tray supported in said cradle;
said cross-bar extending adjacent the rear end of said cradle and forming a stop and support for said end of said cradle;
the support for said cradle comprising a bracket member secured to and extending forward of each front leg; a vertically directed slot in each bracket member having an opening substantially at the top of said bracket member;
a securing member extending in part, horizontally from each side of said cradle;
said securing member being receivable in and resting in said slot.

4,074,684
DRAIN SYSTEM FOR PROTECTING BUILDINGS AGAINST FLOODING AND METHOD

John W. Biesel, 3139 Taylor Drive, Jeffersonville, Ind. 47130

Filed Aug. 23, 1976, Ser. No. 716,543
Int. Cl.[2] E03F 1/00
U.S. Cl. 137—1 11 Claims

9. A method for protecting a building against flooding caused by the overflow of a liquid from a liquid drain line into said building to which said drain line is connected, the steps of which comprise
providing means for draining a floor of a liquid,
connecting in a watertight manner said floor draining means to a ceiling supporting column defining a hollow interior which rises a preselected distance above said floor draining means, and
venting said hollow interior at a preselected vertical distance above said floor draining means to permit said liquid to

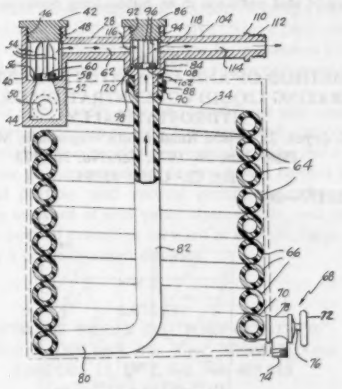


recede from said hollow interior through said floor draining means as said overflow subsides.

4,074,685
APPARATUS FOR MIXING MEDICATION WITH WATER SUPPLY

Gilbert E. Dodd, Rte. 6, Boaz, Ala. 35957

Filed July 16, 1976, Ser. No. 706,114
Int. Cl.[2] F16K 19/00
U.S. Cl. 137—101.11 15 Claims



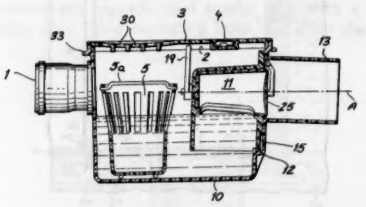
1. Apparatus for mixing a first liquid with a second liquid which comprises:
means for containing a first liquid which comprises a multiple-loop coiled tubular conduit having an inlet end and an outlet end;
conduit means connected to said inlet end for providing a second liquid to be mixed with said first liquid;
means coupled to said outlet end of said containing means for combining said first and second liquids; and
said second liquid comprising means in fluid communication with said containing means for driving said first liquid to said combining means.

4,074,686

MANUALLY CLOSABLE ANTI-BACKUP TRAP

Bernhard Kessel, Ingolstadter Str. 20, 8073 Kosching, Germany

Filed May 20, 1976, Ser. No. 688,282
Claims priority, application Germany, May 21, 1975, 2522426; May 21, 1975, 2522427
Int. Cl.[2] E03C 1/286, 1/288
U.S. Cl. 137—247.19 6 Claims



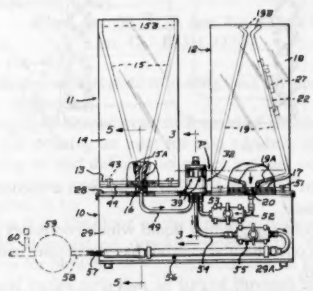
1. An anti-backup trap for a drain, comprising:
an upwardly open housing having a sidewall provided with an exit port for entering waste water;
a tubular insert in said housing adjacent said sidewall, said insert having a bottom inlet beneath the level of said exit port and a side outlet registering with said exit port;
a flap hinged to said insert for outward swinging to facilitate the outflow of water, said flap forming a check valve to prevent the return of water from said exit port to said housing; and
manually operable shutter means in said insert interposed between said inlet and said outlet, said shutter means being accessible through the top of said housing;
said insert being provided with an apertured partition curved about a substantially horizontal axis, said outlet being substantially centered on said axis, said shutter means comprising a tubular valve body with a peripheral wall conforming to the curvature of said partition, said body resting on said partition for rotation about said axis and having a peripheral opening alignable with an aperture of said partition in an unblocking position.

4,074,687

METHOD OF AND APPARATUS FOR USE IN GENERATING LIQUID CONCENTRATION GRADIENTS HYDROSTATICALLY

John E. Joyce, 22 Nelson Road, South Weymouth, Mass. 02190

Filed June 30, 1976, Ser. No. 701,173
Int. Cl.[2] G05D 11/03
U.S. Cl. 137—266 15 Claims



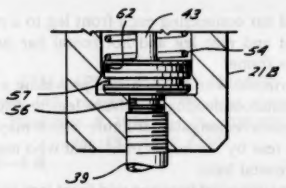
1. A hydrostatic liquid concentration gradient generator including first and second chambers open at their upper ends, the first for a first liquid and the second for a second liquid, said chambers including portions of the same volumetric capacity and of a cross section that decreases vertically in area in the same manner from a maximum at one end to a minimum at the other with the smallest cross sectional area of the first chamber portion and the largest cross sectional area of the second chamber portion the bottoms thereof, and a pressure regulator including an outlet and inlets, one inlet for each chamber and placed in communication with the bottom thereof and both inlets opening in the pressure regulator above the outlet thereof independently of each other and at the same level to establish a pressure reference plane, the inlet in communication with the second chamber and the outlet each including an on-off valve, and the second chamber positioned with the maximum cross sectional area of its tapering portion in said pressure reference plane.

4,074,688

PILOT VALVE

David E. Snyder, Longview, Tex., assignor to U. S. Industries, Inc., New York, N.Y.

Division of Ser. No. 663,272, March 3, 1976. This application May 23, 1977, Ser. No. 799,214
Int. Cl.[2] F16K 17/00
U.S. Cl. 137—269 1 Claim



1. A valve, comprising a body having a bore extending longitudinally therein and lateral ports connecting with the bore at longitudinally spaced locations, a valving element longitudinally reciprocable within the bore between first and second positions, said valving element having longitudinally spaced seal rings thereabout sealably slidable within the bore for controlling the flow of a first fluid between the lateral ports in each of said positions, said body having a chamber at one end of the bore including a cylinder having an inner enlarged diameter portion, an outer reduced diameter portion disposed coaxially of the bore and a circumferential recess at the intersection of the enlarged and reduced portions, a piston longitudinally reciprocable within the cylinder between first and second positions, means connecting the valving element to the piston for longitudinal movement therewith between its first and second position, said piston including an enlarged diameter portion longitudinally reciprocable within the enlarged diameter cylinder portion and a reduced diameter portion longitudinally reciprocable within the reduced diameter cylinder portion, said reduced piston portion having a first groove thereabout to receive a first seal ring for sealably sliding within the reduced cylinder portion said body having a port therein connecting with the reduced cylinder portion on the outer side of the first seal ring thereabout, said enlarged piston portion having second and third longitudinally spaced grooves thereabout each to receive second and third seal rings, respectively, for sealably sliding within the enlarged cylinder portion, the third groove being so located that when the third seal ring is received therein, it remains sealably engaged with the enlarged cylinder portion during reciprocation of the piston between its first and second positions, whereby, in the absence of said first and second seal rings, the piston is urged from its second toward its first position by a force due to the pressure of the second fluid acting over the third seal ring, and the second groove being so located that when the second seal ring is received therein, it is disposed within said recess when the piston is in its second position, but moves into sealing engage-

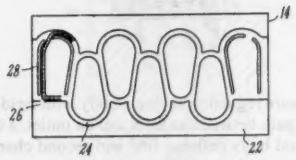
ment with the enlarged cylinder portion when the first seal ring moves out of sealing engagement with the reduced cylinder portion, whereby, in the absence of said third seal ring, the piston is initially urged from its second toward its first position by a force due to the pressure of the second fluid acting over the first seal ring and then by a force due to the pressure of said second fluid acting over the second seal ring.

4,074,689

SPOOL VALVE DISTRIBUTOR

Daniel Lenay, Puteaux, France, assignor to Societe Anonyme des Establissements Jouvenel & Cordier, Rueil-Malmaison, France

Filed Dec. 13, 1976, Ser. No. 750,111
Claims priority, application France, Jan. 26, 1976, 76 01958
Int. Cl.[2] F17B *1/08*
U.S. Cl. 137—270 **6 Claims**



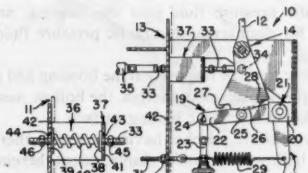
1. Spool-valve distributor of the type comprising a pair of control pistons operating in opposition to each other and two end covers provided with passage means for circulating the piston control fluid, wherein the assembling face of the body of said distributor comprises in a manner known per se grooves adapted to receive a seal interposed between the base member solid with the hydraulic or pneumatic device actuated by said distributor and the distributor body, some of said grooves being provided with lateral ribs, the positioning of said seal on one or the other side of said ribs permitting of sealing said distributor body with base members having different standards and dimensions.

4,074,690

PRE-ADJUSTED CONTROL MODULE FOR CONSTRUCTION VEHICLES

Stanley B. Adams, Yorkville; Frederick A. Carbaugh, East Aurora, and John R. Cryder, Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 8, 1976, Ser. No. 674,785
Int. Cl.[2] G05G *1/04, 13/00*
U.S. Cl. 137—344 **17 Claims**



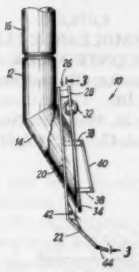
1. A control module adapted for preadjustment and mounting on a vehicle comprising
   a bracket assembly adapted for attachment to a support structure of said vehicle,
   a control lever,
   pivot means pivotally mounting said control lever on said bracket assembly,
   releasable holding means for selectively holding said control lever in at least one pivoted position thereof on said bracket assembly comprising a bellcrank pivotally mounted on said bracket assembly, follower means mounted on said bellcrank and notch means formed on said control lever and adapted to selectively engage said follower for holding said control lever in said pivoted position,
   a control rod reciprocally mounted in said bracket assembly and having a first end thereof pivotally connected to said control lever and adapted to have a second end thereof connected to a control valve, and
   pre-adjusted sensing means connected between said bracket assembly and said control rod for alerting an operator by feel upon approach of said pivoted position of said control lever.

4,074,691

OPEN SHROUD TRICKLE VALVE

Edward C. Luckenbach, Mountainside, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed July 1, 1976, Ser. No. 701,598
Int. Cl.[2] F16K *15/00*
U.S. Cl. 137—382 **6 Claims**



1. In a trickle valve comprising a conduit having a discharge opening and a hingedly mounted valve closure plate disposed with respect to said discharge opening for movement between opened and closed positions, wherein the improvement comprises:
   (a) a baffle plate fixedly secured to and about said conduit at a location spaced rearwardly from said discharge opening, said baffle plate comprising a vertical portion and a lower deflector portion angularly disposed with respect to said vertical portion, said vertical portion extending transversely outward of said valve closure plate, and said deflector portion extending forward of said discharge opening for a predetermined distance.

4,074,692

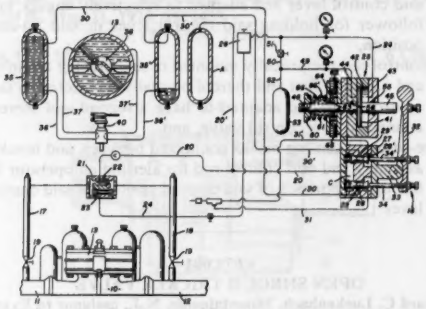
PIPELINE BREAK SHUTOFF CONTROL

Homer J. Shafer, 2300 Park Ave. West, Mansfield, Ohio 44906

Filed Oct. 15, 1971, Ser. No. 189,613
Int. Cl.[2] F16K *17/00*
U.S. Cl. 137—488 **4 Claims**

1. A pipeline control for operating the main valve in a pipeline in response to a predetermined pressure drop in a predetermined period of time, comprising a pressure movable element having a shaft, conduits connecting the pipeline to opposite sides of said element normally to hold it in neutral position, control means actuatable by movement of said element to operate said main valve, a pressure tank connected to one of said conduits to create a pressure differential on said element when a drop in pressure occurs in the pipeline, orifice means timing the rate of differential pressure increase on said element due to pressure drop in the pipeline, an equalizing valve to connect said conduits and restore balanced pressure to said

element, a cam surface on said shaft, a spring-biased detent radially engaging said cam surface for exerting a predetermined amount of restraining force on the movement of said



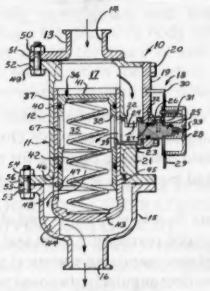
element by differential pressure on opposite sides thereof, and a timing relay to open said equalizing valve if said detent does not release said shaft in a predetermined period of time after initiation of a pressure differential on said element.

4,074,693

READILY DISASSEMBLEABLE FLUID FLOW RATE CONTROLLER

Willard A. Kates, Winnetka, Ill., assignor to The W. A. Kates Company, Deerfield, Ill.

Filed July 26, 1976, Ser. No. 708,708
Int. Cl.[2] G05D 7/01
U.S. Cl. 137—454.6 **13 Claims**



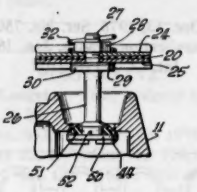
1. A readily disassembleable fluid flow rate controller comprising: a housing including a body defining a midportion and an outlet portion, a bonnet defining an inlet, and first readily removable securing means removably securing the body to the bonnet to define an internal control chamber, said body defining an inlet opening opening to the bonnet for receiving fluid delivered through said bonnet inlet into the bonnet, said body further defining an outlet opening; orifice means in said control chamber and having adjusting means for providing an adjustable size orifice to provide a selected fluid flow from said inlet opening; second readily removable securing means removably securing said orifice means to said housing for installation in and removal from said control chamber as a unit; third readily removable securing means for removably securing said outlet portion of the body to said midportion; and spring biased regulating means in said control chamber for maintaining a preselected pressure flow rate of the fluid passing from said orifice means to said outlet, said regulating means being arranged to be slidably installed in and removed from said body midportion as a unit, said regulating means being retained against slidable movement outwardly from said body by said outlet portion as an incident of said outlet portion being mounted to said midportion and being slidably removable as a unit from said body upon removal of said outlet portion from said midportion.

4,074,694

PRESSURE REGULATOR WITH SOFT VALVE SEAT

Walter S. Lee, Corona, Calif., assignor to Leemco, Inc., Corona, Calif.

Filed Apr. 9, 1976, Ser. No. 675,284
Int. Cl.[2] F16K 31/12
U.S. Cl. 137—505.41 **1 Claim**



1. In a pressure regulator having a body with rigid valve seat in a gas flow path between an inlet and an outlet, a diaphragm mounted in said body defining first and second chambers, and a valve stem carried on said diaphragm for movement toward and away from said seat, the improvement comprising in combination:

a resilient annular valve insert; and

means for carrying said insert on said valve stem for engagement with said seat, with said stem having a rigid flange with an outside diameter greater than the diameter of the opening of said seat whereby said flange cannot pass through said seat opening and

with said means for carrying including an annular groove formed integral with said stem, with said insert fitting into said groove and stretched over a portion of said stem for insertion into said groove.

4,074,695

PRESSURE-RELIEF VALVE DEVICES

Walter Weirich, Dortmund, and Willy Kussel, Lunen, both of Germany, assignors to Gewerkschaft Eisenhutte Westphalia, Westphalia, Germany

Filed Feb. 17, 1976, Ser. No. 658,624
Claims priority, application Germany, Feb. 19, 1975, 2506928
Int. Cl.[2] F16K 31/12
U.S. Cl. 137—508 **13 Claims**

1. A pressure-relief valve device comprising:

(a) a housing provided with conduit means for admitting hydraulic pressure fluid into the housing, and conduit means for discharging hydraulic pressure fluid from the housing;

(b) a hollow member disposed in the housing and guided and sealed for displacement therein, the hollow member being provided with a valve seating surface;

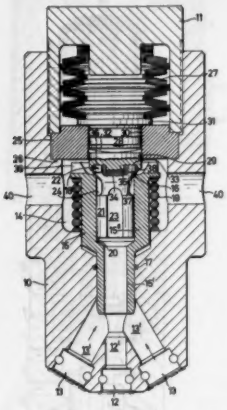
(c) a valve closure member having a portion thereof guided by the hollow member for displacement therein, the valve closure member having a complementary sealing surface engageable on the seating surface of the hollow member to effect closure of the valve constituted by the two surfaces, the valve closure member having channel means communicating through the interior of the hollow member with the admitting conduit means of the housing to permit pressure fluid to reach the inlet side of the valve, and the valve having an outlet side which communicates with the discharging conduit means of the housing;

(d) stop means for limiting movement of the hollow member in one direction as the hollow member is displaced by the

pressure of the fluid admitted by the admitting conduit means;

(e) plural spring means for providing a force to the valve to urge the two surfaces thereof together to thereby bias the valve into a closed condition, the plural spring means being composed of first spring means acting on the hollow member to bias the hollow member in said one direction, and second spring means acting on the valve closure member in the opposite direction;

(f) means for transmitting force from the second spring



means to the valve closure member utilizing a pair of surfaces at least one of which is non-planar so that the surfaces engage one another over a zone aligned centrally of the sealing surface of the valve closure member, said transmitting means including a thrust member in face-to-face contact with one end of the valve closure member remote from the guided portion thereof, said contact being over an extended area; and

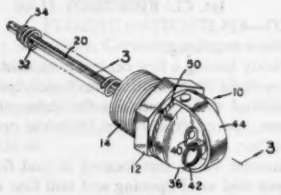
(g) guide means for guiding said thrust member for axial movement centrally of the sealing surface of the valve closure member.

4,074,696

PRESSURE RELIEF VALVE OPERATION SIGNAL

Robert F. Romanowski, Rochester, N.Y., assignor to Qualitrol Corporation, Fairport, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,422
Int. Cl.[2] F16K *37/00*
U.S. Cl. 137—553 **2 Claims**



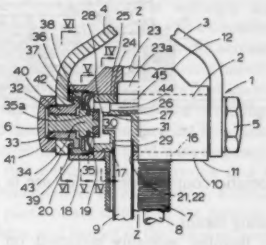
1. A pressure relief valve operation signal for use on a valve having a body portion adapted to be secured to a pressure vessel, a plunger which is spring biased into seating engagement with an end of the body portion to maintain pressure in the vessel, and a shield secured to an exterior portion of the plunger, said operation signal comprising a flexure element in the form of an elongated flat spring one end of which is secured to the shield the other end of the flexure element being provided with a stud having an end positionable in a peripheral groove formed in the body portion, said stud being maintained in said groove by engagement by the shield and being free to move out of said groove when the shield is moved with the plunger as the latter is unseated from the end of the body portion.

4,074,697

DUAL HANDLE MIXING FAUCET

Gustav Saether, Leksvik, Norway, assignor to Lyng Industrier A-S Leksvikarmatur, Leksvik, Norway

Filed June 28, 1976, Ser. No. 700,303
Claims priority, application Norway, July 4, 1975, 752426
Int. Cl.[2] F16K *19/00*
U.S. Cl. 137—606 **6 Claims**



1. A dual handle faucet for mixing and supplying hot and cold water, said faucet comprising:

a substantially symmetrical faucet casing having hot and cold water inlets and a mixed water outlet, said faucet casing having extending transversely therethrough a cylindrical bore;

a cylindrical valve seat body fixedly positioned and supported within said bore;

said valve seat body having adjacent each axial end thereof an annular axial sleeve-shaped end portion having an outer diameter less than the diameter of said valve seat body, the axial outer face of each said end portion forming a valve seat;

said valve seat body having therein two separate substantially L-shaped passages, each said L-shaped passage comprising a first outlet portion extending axially of said valve seat body through a respective said end portion thereof, and a second inlet portion extending radially outwardly from said first outlet portion through said valve seat body to the exterior thereof and joined to a respective of said hot and cold water inlets;

said valve seat body having therein a substantially T-shaped passage comprising a first axial portion extending axially through a portion of the axial length of said valve seat body at a position therein between the outer peripheral surface thereof and said axial end portions thereof, and a second radial portion extending radially outwardly from said first axial portion through said valve seat body to the exterior thereof and connected to said mixed water outlet;

a pair of valves mounted in said faucet casing, one each adjacent a respective of said valve seats; and

a pair of valve actuators, one each attached to a respective of said valves, each said valve actuator comprising a handle for selectively independently moving the respective said valve between a closed position contacting the respective valve seat and blocking fluid communication between the respective said L-shaped passage and said T-shaped passage, and an open position spaced from said respective valve seat and allowing fluid communication between said respective L-shaped passage and said T-shaped passage, said handles being arranged in cantilever fashion adjacent one another such that they may be simultaneously operated by hand, said handles having end portions and said faucet casing having an outlet portion configured such that said faucet casing outlet portion limits movement of

said handles in a direction to achieve movement of said valves to said closed positions thereof.

4,074,698

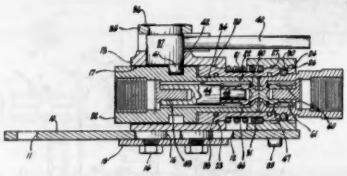
HYDRAULIC COUPLER

Willis S. Hobson, Columbus, and Elmer A. Graber, Seymour, both of Ind., assignors to Seymour Manufacturing Co., Inc., Seymour, Ind.

Filed July 26, 1976, Ser. No. 708,547

Int. Cl.[2] F16L *37/28, 29/00*

U.S. Cl. 137—614.06 **9 Claims**



1. An automatic coupling device for use in a fluid circuit, comprising:

a. A mounting means,

b. a body member movably mounted on the mounting means,

c. a sleeve member movably mounted on the body member, the sleeve member having a bore,

d. a coupler nipple detachably connected to the sleeve member, the nipple including a first valve means urged toward a closed position and being movable to an open position,

e. releasable means between the mounting means and the sleeve member for releasably retaining the nipple on the sleeve member,

f. a valve body means having a passage with an inlet end for connection to a fluid line, the valve body means being slidably mounted in the bore of the sleeve member, the valve body means being movable to a first position to preclude substantially relative movement of the sleeve member and body member for locking of the nipple in the releasable means, and being movable to a second position to allow relative movement of the sleeve member and body member for insertion of the nipple in the releasable means,

g. cam means connected to the valve body means for sliding the valve body means in the bore of the sleeve means and for moving the valve body means between the first and second positions, and

h. the valve body means including a second valve means urged to a closed position and being movable to an open position, the first and second valve means engaging and opening when the valve body means is in the first position and the nipple is attached, to form a fluid passageway through the valve body means and nipple, and disengaging and closing when the valve body means is moved to the second position, even when the nipple is attached.

4,074,699

FLUID-ASSISTED ELECTROMAGNETIC CONTROL DEVICE

Harald Stampfli, Geneva, Switzerland, assignor to Lucifer S.A., Geneva, Switzerland

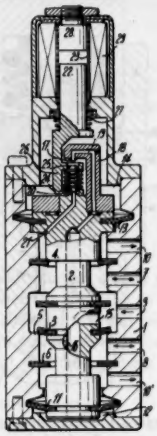
Filed Apr. 13, 1976, Ser. No. 676,414

Claims priority, application Switzerland, Apr. 29, 1975, 5513/75

Int. Cl.[2] F16K *31/365, 31/40*

U.S. Cl. 137—625.64 **4 Claims**

1. A fluid assisted electromagnetic control device comprising a hollow valve body, a movable valve element therein, an electromagnetic device having an armature mounted on said body, fluid pressure inlet, outlet and exhaust passages in said valve body, means on said movable valve element for controlling the flow of fluid under pressure to said inlet, outlet and exhaust passages, means on said movable valve element forming with the valve body a first working chamber at one end of said valve element and a second working chamber at the other end of said element, first nozzle means extending from a base on said movable valve element and extending into said first chamber and communicating with said exhaust passage, second nozzle means extending from a base on said movable valve element in said first chamber in alignment with and spaced from said first nozzle means and communicating with said



pressure inlet passage, an obturating member connected with said armature comprising two spaced supports, two plungers on said supports and biased into engagement therewith, said plungers being in alignment with and adapted to obturate said nozzles alternately, whereby upon movement of said armature in either direction, a plunger will engage a nozzle and obturate it, and upon further movement, the plunger will yield and the plunger support will engage the nozzle base to positively move the valve element, and means permanently connecting said second working chamber with said pressure inlet passage.

4,074,700

QUICK-ACTING VALVE ASSEMBLY

Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Continuation of Ser. No. 484,188, June 28, 1974, abandoned. This application Sept. 23, 1975, Ser. No. 616,097

Int. Cl.[2] F16K *25/00, 31/06*

U.S. Cl. 137—625.27 **2 Claims**

1. A valve comprising:

a valve body having a first central bore, said bore having an axial opening for admitting fluid under pressure and first and second radial openings for exhausting fluid under pressure, spaced axially from said axial opening and from each other;

a first annular valve seat located in said first central bore between said axial opening and said first radial opening;

a second annular valve seat located in said first central bore between said first radial opening and said second radial opening;

a valve carrier piston slidably received in said first central bore;

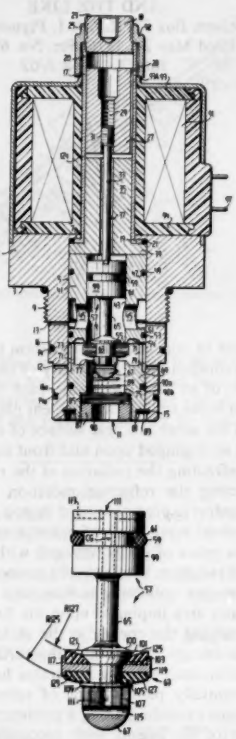
a valve washer assembly mounted on one end of said carrier piston for selective seating on said first or said second annular valve seat;

a second central bore extending axially through said valve carrier piston and valve washer assembly;

an adjustment nut threaded within said first central bore below said first annular valve seat and a spring captured

between said adjustment nut and said valve washer assembly for biasing said valve washer assembly into contact with said second annular valve seat;

means cooperating with said valve carrier piston for moving said valve washer assembly out of contact with said sec-



ond annular valve seat and into contact with said first annular valve seat; and

means for essentially eliminating the dynamic component of the fluid pressure in said second central bore, whereby static pressure alone is experienced at the other end of said carrier piston.

4,074,701

FLUIDIC SWITCH

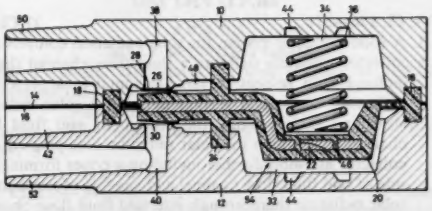
Lothar Kemmler, Morfelden, Germany, assignor to Samson AG, Frankfurt, Germany

Filed July 8, 1976, Ser. No. 703,609

Claims priority, application Germany, July 8, 1975, 2530362

Int. Cl.[2] F15C *3/04*

U.S. Cl. 137—625.66 **7 Claims**



1. Fluidic switch for measuring, regulating or controlling apparatus, comprising: a switch housing having two housing halves separated along a plane of separation and each provided with internal grooves parallel to said plane of separation, two actuating chambers provided in the switch housing, actuating passages leading into said chambers, an actuating membrane separating said chambers and having at its circumferential margin a sealing bolster substantially parallel to said plane of separation; a switch valve chamber having fluid inlets and outlets; and an actuating lever extending from the actuating membrane into the switch valve chamber, said lever forming a plate valve body at the end of the membrane which extends into said switch valve chamber, and being fulcrumed about an axis parallel to said plane of separation on a resilient bridge-like or plate-like lead-through portion sealingly separating the actuating chambers from the switch valve chambers, said body being integrated as a rubber body with the actuating lever and clamped within said grooves in the housing halves, said sealing bolster forming said membrane margin and surrounding with clearance said valve body section of said actuating lever at that end of the lead-through portion farthest from said membrane, said sealing bolster having a chord-wise disposed cross member bordering the membrane and forming said lead-through portion, said cross member being higher in a direction perpendicular to said plane of separation of the housing halves than said sealing bolster, and having in the plane normal to the plane of separation of the housing convexly curved upper and lower edges each facing one of the housing halves, the height of said cross member being greatest in the area of the longitudinal center of the cross member and coinciding with the height of the sealing bolster adjacent the ends of the cross member.

4,074,702

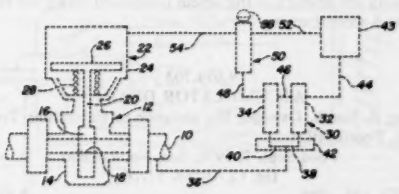
CONTROL VALVE FOR BLEEDING FLUID ACTUATOR

Irwin M. Lewis, New Rochelle, N.Y., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,056

Int. Cl.[2] F16K *31/00*

U.S. Cl. 137—625.66 **2 Claims**



1. A control valve structure for controlling fluid communication between a first fluid pressure source and a main valve actuator mechanism and being responsive through pilot valve means to a predetermined operating pressure range in a main flowline, said control valve structure comprising:

an elongated housing having a central bore extending longitudinally thereof;

a slide valve mounted within the bore for longitudinal movement and having a piston adjacent one end thereof mounted within an enlarged diameter portion of said bore forming a piston chamber, a first spring continuously urging the slide valve and piston to a seated position of the piston adjacent one end of the piston chamber, manual gripping means adjacent the other end of said slide valve to permit the slide valve to be gripped manually to move the piston to a raised operative position against said first spring adjacent the other opposite end of the piston chamber, said enlarged diameter portion being of a uniform continuous diameter and forming an abutment on which the piston seats under the urging of said first spring when

the fluid pressure is outside the predetermined operating range;

first port means including inlet and outlet ports in said housing for communicating fluid from a pressure source through the housing to the actuator mechanism;

second port means communicating with the piston chamber adjacent an inner face of the piston and responsive through the pilot valve means to fluid pressure in the main flowline outside the predetermined operating pressure range, said second port means communicating fluid pressure to the piston for maintaining the slide valve in a position normally permitting fluid pressure to be supplied through the control valve structure to the actuator mechanism when the pressure within the flowline is within the predetermined operating pressure range;

a vent in said housing communicating with the piston chamber adjacent the inner face of said piston;

said piston having an outer periphery slightly spaced from the inner circumferential wall defining the piston chamber so that fluid from the second port means passes between the piston and the circumferential wall upon any initial unseating of the piston from seated position to permit excess fluid pressure from said second port means to be vented around said piston and through said vent, said circumferential wall having an annular groove generally adjacent said opposite end of the piston chamber, an O-ring positioned in said annular groove and projecting inwardly of the circumferential wall a distance at least around 0.003 inch to contact the outer periphery of the piston in fluid-tight sealing relation when the piston is in said raised position thereby to prevent fluid from said second port means to by-pass said piston, said annular groove having a width greater than the diameter of said O-ring for loosely mounting said O-ring;

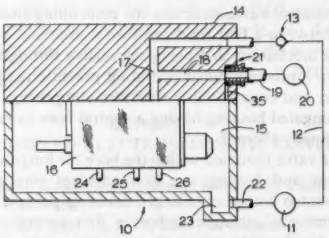
a manual detent normally depressible inwardly to engage the slide valve and hold the slide valve in a raised position against the bias of said spring, and a second spring continuously urging the detent outwardly whereby upon the reaching of a predetermined high pressure in said second port means the slide valve is moved out of engagement with the detent and the detent is released under the bias of said second spring.

4,074,703

ACCUMULATOR DRAIN

Duane R. Smith, Oswego, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 7, 1976, Ser. No. 720,860
Int. Cl.[2] F16K *51/00*
U.S. Cl. 137—798 **8 Claims**



1. In a hydraulic system having fluid control means, said fluid control means having a sump in fluid communication therewith, a source of high pressure fluid, and disconnectable conduit means communicating said source with said control means, the improvement comprising:

safety connecting means for connecting said conduit between said source and said control means, said connecting means including vent means for automatically venting said source to the sump upon partial disengagement of said connecting means.

4,074,704

PROCESS OF AND APPARATUS FOR SOLAR HEATING AND THE LIKE

Donald P. Gellert, Box 37, R.F.D. 1, Plymouth, N.H. 03264

Filed May 28, 1976, Ser. No. 691,092
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 **33 Claims**

1. A process of concentrating radiation that comprises: impinging the radiation upon a plurality of successive staggered front surfaces of an array of prisms, each front surface being oriented at an acute angle to an adjacent plane extending along the length of the array at a rear surface of each prism; passing the radiation so impinged upon said front surfaces through the prisms and refracting the radiation at the rear surfaces of the prisms; directing the refracted radiation upon a collecting surface located at a predetermined region behind said plane; adjusting the said acute angle of orientation with reference to the refraction index of the prisms and within limits such that the refracted radiation is effectively concentrated to provide greater energy per collecting surface area than the radiation energy per unit area impinged upon the first-named surfaces, thereby amplifying the energy at the collecting surface; and absorbing the energy at the collecting surface.

17. Radiation-concentrating apparatus having, in combination, a substantially planar array of substantially parallelly mounted prisms extending along a predetermined plane at the rear surfaces of the prisms with successive staggered front prism surfaces exposed to impinging radiation; energy-absorbing means comprising a collecting surface disposed rearward of said plane; said prisms being selected with an acute included angle between said rear and front surfaces and a refractive index such as to concentrate the radiation impinged upon the front prism surfaces into a smaller area, after refraction at the rear surfaces of said prisms, upon the energy-absorbing means, thereby to amplify the energy from the radiation at said collecting surface; and means for utilizing the energy thus concentrated.

4,074,705

SOLAR COLLECTOR APPARATUS AND METHOD

Glen P. Robinson, Jr., Atlanta; Samuel V. Shelton, Stone Mountain, and Samuel F. Hutchins, Lilburn, all of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

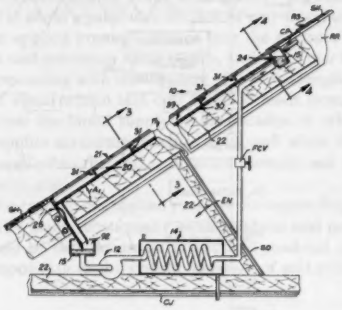
Filed Feb. 23, 1976, Ser. No. 660,249
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **27 Claims**

1. A solar collector system for solar radiation comprising:

a collector assembly defining a fluid flow channel therein inclined with respect to the horizontal at a prescribed inclination angle and further defining a solar radiation absorbing surface along the bottom of said fluid flow channel onto which the solar radiation is impressed, said collector assembly further including a cover forming one side of said fluid flow channel and capable of transmitting solar radiation therethrough into said fluid flow channel;

a heat transfer fluid for flowing down said fluid flow channel over said solar radiation absorbing surface under said

cover, said heat transfer fluid having a fluid vapor pressure differential between the maximum and minimum temperatures to which said heat transfer fluid is exposed during flow down said fluid flow channel of less than about 0.3 psia; and,



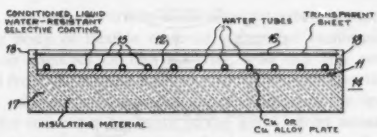
means for supplying said heat transfer fluid to the upper end of said channel for the flow of said heat transfer fluid along said channel over said solar radiation absorbing surface under the force of gravity to heat said transfer fluid.

4,074,706

SOLAR COLLECTOR HAVING SELECTIVE FILM OF IMPROVED STABILITY TO LIQUID WATER CONDENSATE

Juan Hajdu, Orange, and Raymond A. Sosnowski, Bridgeport, both of Conn., assignors to Enthone, Incorporated, West Haven, Conn.

Filed July 30, 1975, Ser. No. 600,344
Int. Cl.[2] F24J *3/02;* **C23F** *7/02, 17/00*
U.S. Cl. 126—271 **30 Claims**



1. A solar collector comprising a base of copper or copper alloy, and a stable, selective, solar heat energy-absorptive coating on the base, said selective solar heat energy-absorptive coating comprising a multiplicity of discrete projections of copper oxide, said selective, solar heat energy-absorptive coating having been rendered stable by contacting the selective, solar heat energy-absorptive coating on the base with a chromic acid solution comprising chromic anhydride ($Cr\ O_3$) and water for a time sufficient to impart to thee selective coating a stability such that its selectivity is not significantly reduced after contact with liquid water over a prolonged, cumulative, non-continuous time in excess of 1600 hours.

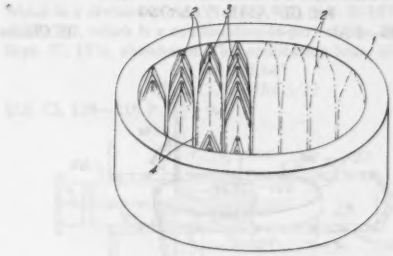
4,074,707

MELT-SPINNING GRID

Arthur Perelman, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 8, 1976, Ser. No. 664,736
Claims priority, application United Kingdom, Mar. 13, 1975, 10453/75
Int. Cl.[2] D01D *1/04;* **F28D** *21/00*
U.S. Cl. 126—343.5 A **3 Claims**

1. An improved melt grid for the melting of solid particulate polymer, which melt grid comprises a plurality of elongated aligned fins defining an upper receiving face and a lower effluent face connected by at least one first aperture of elongated cross-section, at least one second aperture longitudingly disposed within one of said fins intermediate the upper and lower faces providing a heat-receiving surface within the melt grid,



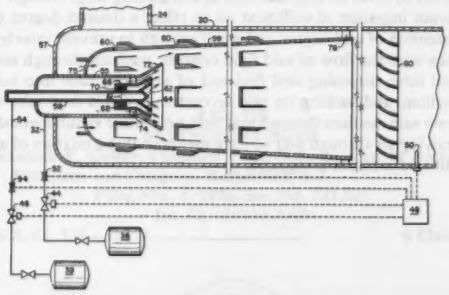
wherein the improvement comprises said first aperture is formed by opposed sides of two fins with at least one of said sides bearing a plurality of grooves running in a direction from said upper receiving face to said lower effluent face, and wherein said grooves have a width of at least 1 mm.

4,074,708

BURNING HYDROGEN AND OXYGEN TO SUPERHEAT STEAM

Frank William Hochmuth, Hudson, Canada, assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed June 7, 1976, Ser. No. 693,252
Int. Cl.[2] F24H *1/20*
U.S. Cl. 126—360 A **3 Claims**



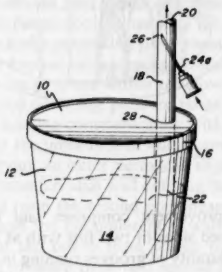
1. Apparatus for burning hydrogen and oxygen directly within a steam line, including a steam pipe through which steam is flowing, a burner housing positioned centrally within the pipe, there being an annular space between the pipe and the burner housing through which the steam flows, pipes within the housing through which oxygen and hydrogen are introduced, ignition means for igniting the hydrogen and oxygen, the burner housing containing a plurality of openings so that the cooling steam can flow along both sides thereof, some of the openings being located upstream of the ignition means, temperature sensing means positioned downstream of the burner housing for determining the proportionate amount of hydrogen to oxygen being supplied to the burner housing, means responsive to said temperature sensing means for controlling the proportionate amount of hydrogen to oxygen flowing to the burner housing, and diffuser means upstream of the temperature sensing means to cause turbulence and intermixing of the steam leaving the burner housing.

4,074,709

METHOD AND DEVICE FOR FACILITATING DOUBLE-CONTRAST STUDIES OF THE UPPER GASTROINTESTINAL TRACT

Leopold S. Kaplan, 8 Bradford Road, Edison, N.J. 08817

Filed Apr. 15, 1976, Ser. No. 677,242
Int. Cl.[2] A61B 1/12, 6/00
U.S. Cl. 128—2 A **15 Claims**



1. A method for obtaining a gastric mucosal coating of the hollow organs in a human being's upper gastrointestinal tract with a contrast medium and gaseously distending said organs to enhance said coating and enable a double-contrast study of said tract to be performed, said method comprising the steps of providing an open-ended feed tube having first and second ends, providing a vent in said feed tube for the introduction of air; said vent comprising venting means intercommunicating with said feed tube means and being disposed at an angle less than 90° in a direction toward said second end of said feed tube such that air drawn through said venting means will intercept the flow of contrast medium through said feed tube within said feed tube at substantially said angle, said venting means further defining a vent opening having an inner diameter of from 0.020 inches to 0.050 inches, said vent opening being large enough to permit ingestion of sufficient air to effect a desired degree of distention of said organs and small enough to prevent interference with the flow of said fluid contrast medium through said feed tube; disposing said first end of said feed tube into said medium, and sucking on said second end of said feed tube to draw said medium through said feed tube while simultaneously drawing air through said venting means so that a mixture of air and said medium is ingested.

4,074,710

INTRATHORACIC PRESSURE BIOFEEDBACK METHOD

Brian L. Tiep, Monrovia, Calif., assignor to City of Hope National Medical Center, Duarte, Calif.

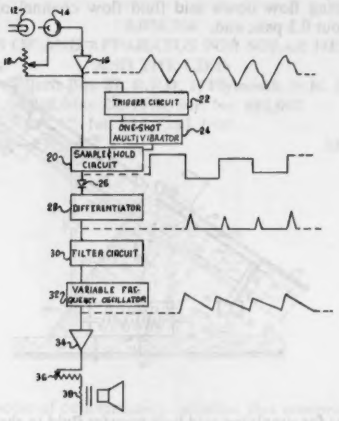
Filed May 28, 1976, Ser. No. 690,851
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—2.05 P **3 Claims**

1. A process for treating an individual having an obstructive lung disorder so that such an individual controls the manner in which his or her heart operates so as to control the individual's intrathoracic pressure which comprises the steps of:

monitoring the pulse of the individual so as to obtain a signal varying in accordance with the peak values of each pulse beat, and

using said signal to provide to the individual an output which is capable of being sensed by the individual and which corresponds to this signal; and

varying the heart activity of the individual by the individual in accordance with said output so as to have the individual's heart action and breathing achieve a desired intrathoracic pressure.

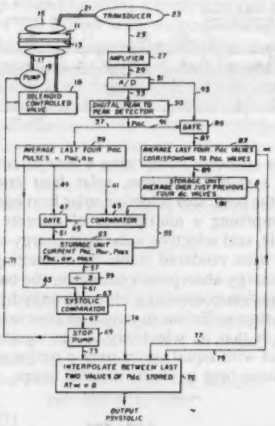


4,074,711

APPARATUS AND PROCESS FOR DETERMINING SYSTOLIC PRESSURE

William Trevor Link; Henry Ferdinand Rugge, both of Berkeley, and William David Jansen, Menlo Park, all of Calif., assignors to American Optical Corporation, Southbridge, Mass.

Continuation-in-part of Ser. No. 578,047, May 15, 1975, Pat. No. 4,009,709. This application Sept. 7, 1976, Ser. No. 720,712
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—2.05 A **7 Claims**



1. An apparatus for determining systolic pressure, comprising:

a pressure cuff attachable to a living test subject adjacent a blood vessel;

means for changing pressure in the cuff and thereby applying pressure to the subject;

means communicating with said cuff for measuring a quantity proportional to a time-dependent fluctuating component representative of the pulsatile pressure within the blood vessel, said means having a frequency response such

that said quantity is proportional to the amplitude of said pulsatile pressure;

means for determining the maximum value attained by said quantity as the applied pressure is changed;

means for storing a representation of said maximum value;

means for determining when said quantity is substantially equal to about a particular fraction of said maximum value for an applied pressure greater than the pressure applied when said maximum value results, said particular fraction corresponding with that fraction of the total length of said blood vessel within said cuff which extends from its end proximal the blood supply to the location at which the cuff applies maximum pressure to its wall when the pressure applied to the cuff is between diastolic and systolic pressure; and

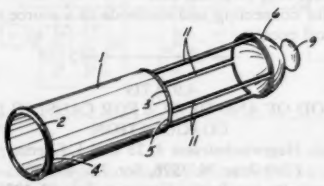
means for reading out applied pressure corresponding to said quantity being substantially equal to about said particular fraction of said maximum value, said read-out pressure corresponding to the systolic pressure of said subject.

4,074,712

PROPHYLACTIC ARTICLE

A. Francis Wright, 25961 Highland Road, Richmond Heights, Ohio 44143

Filed Sept. 27, 1976, Ser. No. 727,270
Int. Cl.[2] A61F 5/00
U.S. Cl. 128—79 **3 Claims**



1. A prophylactic article of the class described, comprising a tubular body of flexible material, a cap and communicating reservoir member of like material, said cap and reservoir spaced from the tubular body to provide an open area therebetween, said cap forming means for covering only the tip of the glans for maximum exposure of the glans whilst maintaining the position of the reservoir, and means connecting the body and member to retain the maximum open area between the same, whilst maintaining the initial relationship thereof.

4,074,713

POLY(N-ACETYL-D-GLUCOSAMINE) PRODUCTS

Richard Carl Capozza, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 558,525, March 14, 1975, Pat. No. 3,989,535, which is a division of Ser. No. 441,717, Feb. 11, 1974, abandoned. This application July 22, 1976, Ser. No. 707,914
Int. Cl.[2] A61F 5/04
U.S. Cl. 128—92 C **2 Claims**

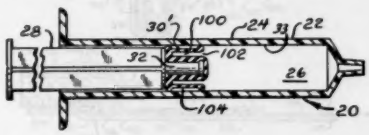
1. A bone pin for the fixture of severed bone ends during regeneration after a traumatic or surgical fracture consisting essentially of a pin of poly(N-acetyl-D-glucosamine) of a diameter to fit into the medullary canal of a fractured bone end, either of natural size, or as drilled to a larger size, and a length of at least three times its diameter, whereby the bone pin is adapted to be a drive or friction fit in each bone end. so that the bone ends are held in fixed relationship in juxtaposition during regeneration of the bone, and the poly(N-acetyl-D-glucosamine) bone pin is later absorbed by the body fluids, permitting regeneration of marrow in the medullary canal.

4,074,714

SYRINGE ASSEMBLY

William J. Binard; Anthony J. Ciarico, both of Cary; Leonard R. Anglada, Arlington Heights, and Bhupendra C. Patel, Elgin, all of Ill., assignors to The Kendall Company, Boston, Mass.

Division of Ser. No. 702,164, July 2, 1976, Pat. No. 4,030,497, which is a division of Ser. No. 627,982, Nov. 3, 1975, Pat. No. 4,000,741, which is a continuation-in-part of Ser. No. 509,757, Sept. 27, 1974, abandoned. This application Mar. 10, 1977, Ser. No. 776,147
Int. Cl.[2] A61M 5/22
U.S. Cl. 128—218 P **2 Claims**



1. A syringe, comprising:

a barrel having a chamber for retaining fluid;

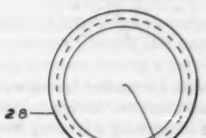
a plunger having one end received in and closing the chamber for pumping fluid out of the chamber, said one end of the plunger having a flexible plug facing the chamber, said plug having slot means defining a flexible sidewall having an enlarged outer portion circumferentially contacting an inner surface of the barrel, and having an intermediate portion of reduced thickness normally spaced from said barrel inner surface, said plug sidewall intermediate portion flexing and engaging against the inner surface of the syringe barrel responsive to pressure in the chamber above a predetermined amount to impede movement of the plunger into the chamber.

4,074,715

SYRINGE PLUNGER

Kenneth E. Geiger, Palisades Park, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Filed Nov. 1, 1976, Ser. No. 737,525
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—218 P **6 Claims**



1. A plunger for a syringe assembly, which comprises;

a handle;

a piston interlock;

a shank joining said handle to the piston interlock;

said interlock including a bar extending distally from said shank; and

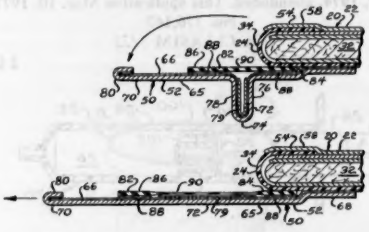
a piston, completely enmeshing and enclosing said bar and making full contact with the interlock, whereby said piston is immovably mounted on said interlock.

4,074,716

DIAPER WITH ELASTIC FASTENER TAB

Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jan. 3, 1977, Ser. No. 756,309
Int. Cl.[2] G61F *13/16*
U.S. Cl. 128—287 **22 Claims**



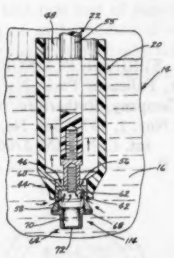
1. A disposable diaper, comprising:
an absorbent pad assembly having opposed surfaces, a pair of side edges, and a pair of end edges connecting the side edges; and
a tape fastener comprising, tape means having a first portion secured to one of said surfaces of the pad assembly, a securement portion for attachment to a spaced portion of the diaper, an extensible portion connecting said first and securement portions, and elastic means constraining expansion of said extensible portion.

4,074,717

CRYOGENIC PROBE

Robert R. Schulze, 4116 - 73rd Place, Des Moines, Iowa 50322, and Floyd R. Ladd, West Des Moines, Iowa, assignors to said Robert R. Schulze, by said Floyd R. Ladd

Filed Apr. 23, 1975, Ser. No. 570,723
Int. Cl.[2] A61B *17/36*
U.S. Cl. 128—303.1 **6 Claims**



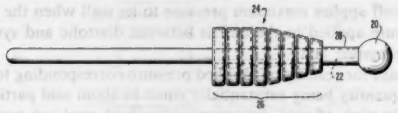
1. In combination with a container having a cryogenic liquid contained therein, said container having an open upper end,
a cryogenic probe comprising a housing having upper and lower ends and an interior compartment, a normally closed valve means movably mounted on the lower end of said housing communicating with said housing interior compartment and being selectively movable between open and closed positions relative to said housing so that the cryogenic liquid in said container will flow through said valve means into said housing interior compartment when said valve means is in its open position and the lower end of said housing is immersed in the cryogenic liquid; said valve means having a tip portion at the lower end thereof and an interior compartment formed therein above said tip portion which is in communication with said housing interior compartment so that the cryogenic liquid in the probe will be closely positioned adjacent said tip portion.

4,074,718

ELECTROSURGICAL INSTRUMENT

Charles F. Morrison, Jr., Boulder, Colo., assignor to Valleylab, Inc., Boulder, Colo.

Filed Mar. 17, 1976, Ser. No. 667,849
Int. Cl.[2] A61B *17/40;* A61N *3/06*
U.S. Cl. 128—303.14 **47 Claims**



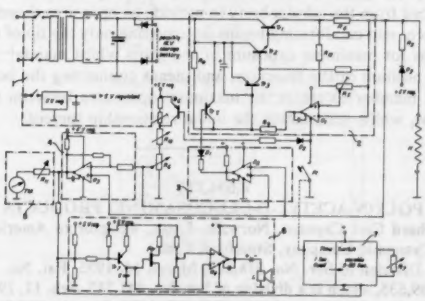
19. An electrosurgical instrument comprising
a support member;
at least one electrode mounted on support member, said electrode comprising (a) a substrate consisting essentially of a material having a figure of merit of at least 0.15 at room temperature where said figure of merit is the product of the thermal conductivity, the heat capacity and the density of said material in the metric system, and (b) an electrically resistive coating disposed on said substrate, the volume resistivity of said coating extending from about 10^{-4} to $10^{4}\Omega$-cm; and
means for connecting said electrode to a source of electrosurgical energy.

4,074,719

METHOD OF AND DEVICE FOR CAUSING BLOOD COAGULATION

Kurt Semm, Hegewischstrasse 4, 23 Kiel 1, Germany

Filed June 24, 1976, Ser. No. 699,305
Claims priority, application Germany, July 12, 1975, 2531261; Dec. 3, 1975, 2554336
Int. Cl.[2] A61B *17/38;* A61N *3/04*
U.S. Cl. 128—303.1 **23 Claims**



1. A device for causing blood coagulation, particularly for use in endoscopy, comprising
a support having an end portion;
an electrically operated thermo-element on said end portion;
current supplying means for supplying electrical current to said thermo-element to increasingly raise the temperature thereof in a predetermined gradient to a level at which it has a coagulation-causing temperature;
control means for maintaining said temperature steady when said level is reached;
visual indicating means for visually indicating the heating of said thermo-element to said level; and
audible indicating means responsive to the increasing heat-

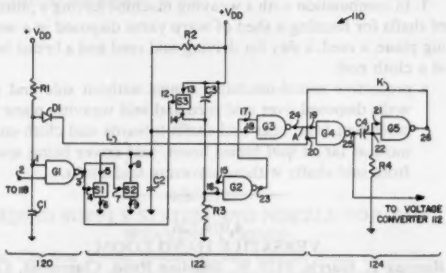
ing of said thermo-element by producing a sound increasing in intensity in correspondence with the increasing heating gradient until said level is reached so as to indicate that the device is ready for use, and which thereafter continues at constant intensity.

4,074,720

CARDIAC PACER WITH RATE RUNAWAY PROTECTION

Franklin L. Malchman, King of Prussia; William J. Raddi, Philadelphia, both of Pa., and Susan Sharples, Cranbury, N.J., assignors to ESB Incorporated, Philadelphia, Pa.

Filed Apr. 7, 1976, Ser. No. 674,380
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PG **8 Claims**



1. An oscillator system suitable for use with a cardiac pacer system, said oscillator system designed so that in the event its primary rate control system accelerates out of control, a secondary rate control system prevents the oscillator from producing signals at a rate greater than a predetermined high rate controlled by the secondary rate control system, said oscillator system comprising:

(a) cycle initiation means responsive to the output from said oscillator system for producing a timing initiation signal;

(b) primary timing circuit means, responsive to the timing initiation signal, for producing a first rate control signal a predetermined time period after receipt of the timing initiation signal;

(c) secondary timing circuit means, responsive to the timing initiation signal, for producing a second rate control signal a predetermined time period after receipt of the timing initiation signal, said predetermined time period normally being less than the predetermined time period for the primary rate control means;

(d) first gate means, responsive to the second rate control signal, for producing an output signal;

(e) second gate means, responsive to the first rate control signal and an output signal from the first gate means, for producing a command signal only upon receipt of both the control signal and said output signal; and

(f) means, responsive to the command signal from the second gate means, for producing an oscillator system output signal with a predetermined width, whereby rate runaway protection is provided because the maximum rate obtainable is restricted by the secondary timing circuit means in the event the primary timing circuit means fails to function properly and produces a first rate control signal before the second rate control signal is produced by the secondary timing circuit means.

4,074,721

BREAST PADS

Donald M. Smits; Patrick J. Daley, both of Green Bay, Wis., and Arnold J. Akerley, Westboro, Mass., assignors to The Kendall Company, Walpole, Mass.

Filed Dec. 27, 1976, Ser. No. 754,384
Int. Cl.[2] A41C *3/00*
U.S. Cl. 128—461 **3 Claims**

1. A cup-shaped breast pad having a first layer forming a body-contacting surface of nonwoven fabric characterized by rapid liquid transmission but low capillary spread of liquid;

a second layer of smaller diameter than said first layer, said second layer consisting of absorbent cellulose wadding characterized by a higher degree of capillary transfer of liquid than said first layer and being centrally disposed on said first layer and coextensive therewith;

a third layer of absorbent cellulose fluff coextensive with said second layer;

a fourth layer of absorbent cellulose wadding coextensive with said third layer;

and a fifth layer of liquid-impermeable material coextensive with said first layer;

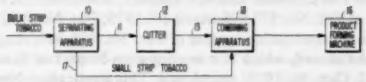
said first layer and said fifth layer being adhesively united to each other around substantially the entire periphery of both layers.

4,074,722

SMOKABLE TOBACCO PRODUCTS AND MANUFACTURING METHODS THEREFOR

Earl E. Kohnhorst, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Apr. 23, 1976, Ser. No. 679,710
Int. Cl.[2] A24D *1/00*; A24L *5/00*
U.S. Cl. 131—8 R **36 Claims**



32. A smokable tobacco product comprised of cut tobacco and small strip tobacco wherein said small strip tobacco consists of bulk strip tobacco having a particle size with a short dimension not in excess of about 0.5 inch, an arithmetic mean size of at least 1.93 mm, and a particle shape wherein the mean ratio of the area to the perimeter squared is at least about 0.049, the small strip tobacco having an inclusion level in the tobacco product no less than 2% by weight of the total tobacco in the product.

4,074,723

PIPE

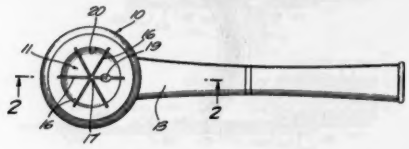
William J. Palenscar, 3788 Highland Drive, Carlsbad, Calif. 92008

Continuation-in-part of Ser. No. 588,605, June 20, 1975, abandoned. This application Oct. 29, 1976, Ser. No. 736,866
Int. Cl.[2] A24F *5/04*
U.S. Cl. 131—198 R **7 Claims**

1. A pipe, a combination of:

(a) a bowl having a side wall and a curved bottom forming a tobacco chamber;

(b) a plurality of air passages in said side wall and said bottom, said air passages extending from the top portion of the tobacco chamber to the bottom thereof, said air passages each having a rectangular cross-sectional shape to have passage side walls and a bottom wall with the width of each passage being sufficiently narrow to prevent tobacco particles from entering said air passage, said passage side walls intersecting said bowl side wall at essentially



right angles to form sharp corners so that tobacco is prevented from entering said air passage, said air passages intersecting each other at the bottom of said tobacco chamber to form a junction, and

(c) a stem extending laterally from said bowl and having a stem opening extending longitudinally therein, said stem opening being connected to one of said air passages near the area of the tobacco chamber bottom to form a connection, said connection being spaced apart from said air passage junction.

4,074,724

TOBACCO SMOKE FILTER RODS HAVING FIBERS BONDED WITH WATER AND GLYCOL BONDING DISPERSIONS

Gerald P. Morie, and Cephas H. Sloan, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 573,228, April 30, 1975, Pat. No. 4,022,740, which is a continuation-in-part of Ser. No. 498,349, Aug. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 411,117, Oct. 30, 1973, abandoned. This application Nov. 5, 1976, Ser. No. 739,372

Int. Cl.[2] A24F *13/06;* D02G *3/00*

U.S. Cl. 131—267 **8 Claims**

1. Tobacco smoke filter rods made with fibers selected from cellulose acetate, poly(ethylene terephthalate) and poly(hexamethylene adipamide) bonded with a water and glycol bonding dispersion, the bonding dispersion being non-tacky and being effective for forming a bond between fibers with the bond being dispersible by water, the bonding dispersion comprising water present in the amount of about 0.1–20% by weight and at least one high boiling glycol present in the amount of about 40–94.9% by weight selected from 1,2-propanediol, 1,3-propanediol, 1,4-butanediol, 1,2-butanediol, and 1,3-butanediol; and water and glycol dispersible polymers present in the amount of about 5–40% by weight selected from polyesters of combinations of isophthalic acid, and the sodium, potassium, or lithium salt of sulfoisophthalic acid reacted with diethylene glycol or triethylene glycol; from terephthalic acid and the sodium, potassium or lithium salt of sulfoisophthalic acid reacted with diethylene glycol or triethyleneglycol.

4,074,725

COVER FOR A WEAVING MACHINE

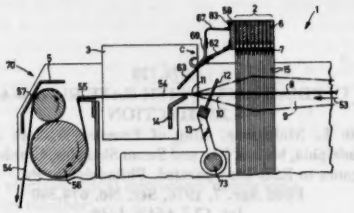
Hartmann Bader, Winterthur, and Ulrich Bolleter, Seuzach, both of Switzerland, assignors to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed June 3, 1976, Ser. No. 692,277

Claims priority, application Switzerland, June 5, 1975, 7236/75

Int. Cl.[2] D03D *49/00;* D03J *1/00*

U.S. Cl. 139—1 R **9 Claims**



1. In combination with a weaving machine having a plurality of shafts for forming a shed of warp yarns disposed in a weaving plane, a reed, a sley for driving said reed and a breast beam at a cloth end;

a protective sound-insulating cover without side and rear walls disposed over said reed and said weaving plane and extending from near said shafts towards said cloth end at most as far as said breast beam, said cover being spaced from said shafts without covering said shafts.

4,074,726

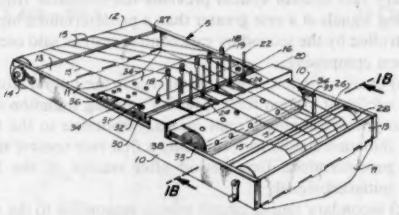
VERSATILE HAND LOOM

Ramsay L. Harris, 1175 W. Baseline Road, Claremont, Calif. 91711

Filed Feb. 26, 1976, Ser. No. 661,692

Int. Cl.[2] D03D *29/00*

U.S. Cl. 139—29 **10 Claims**



1. A loom assembly comprising:

a base member including at least two essentially parallel longitudinal side members;

a warp roller rotatably secured at one end of said base between said side members;

a take-up roller rotatably secured at the other end of said base between said side members;

said rollers being rotatable in the same direction, thereby being adapted to carry warp thread from the first roller to the second;

a warp bar arranged intermediate said rollers and between said side members, said warp bar having a plurality of heddles slidably mounted thereon for vertical, alternate reciprocation and when having warp thread therein, the rising of one heddle and the falling of an adjacent heddle providing alternate warp threads in spaced relation to form a shed;

a shuttle board arranged between said side members adjacent said warp bar in the direction of the take-up roller, said shuttle board having a plurality of upright reeds

thereon to align the warp threads as they travel from the warp roller through the heddles to the take-up roller;

shuttle means for moving a weft thread solely by gravitational forces in reciprocal motion on the surface of said shuttle board across the path of said warp threads in a transverse direction as said warp threads advance;

means for selectively moving a preprogrammed pattern member in association with the advancement of said warp threads, said pattern member cooperating with said heddle members to determine the relative position of each warp thread in said heddle member in conformance with preselected instructions contained upon said pattern member;

said base member, take-up and warp rollers, warp bar, shuttle board and shuttle means together being movable in a vertical plane away from said pattern movement means which nests among them to permit ready insertion or removal of preprogrammed pattern members in said pattern movement means and

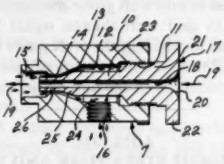
in addition, means to maintain over width of the web formed by the weaving of warp and weft threads comprising selvedge holders arranged over the extreme right and left warps, and temples arranged to hold said selvedge holders apart to the desired width.

4,074,727

LIQUID SUPPLY SYSTEM AND NOZZLE FOR JET WEAVING LOOMS

Clyde Chi Kai Kwok, Montreal, and Joseph Rene Cornellier, Knowlton, both of Canada, assignors to Joseph Rene Cornellier, Knowlton, Canada

Filed May 27, 1976, Ser. No. 690,660
Int. Cl.[2] D03D *47/30*
U.S. Cl. 139—435 **17 Claims**



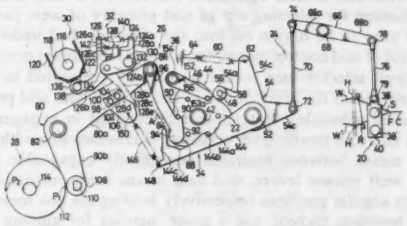
1. In a jet weaving loom, the improvement comprising a liquid supply system and a nozzle for propelling a weft yarn across the open shed of warp yarn, said nozzle comprising a weft yarn passage, an annular liquid passage, and a front outlet surrounding the weft yarn passage, said liquid passage having an inlet in communication with a back chamber, said back chamber feeding into and merging with a first conical forwardly tapering passage portion which in turn feeds into and merges with a forwardly tapering terminal portion, a remote-controlled valve having a liquid outlet connected to the liquid passage inlet of the nozzle, said valve having a liquid inlet, means to supply liquid at substantially constant low pressure to said liquid inlet of said valve, pulse generating means connected to said valve to supply a pulse to the latter of predetermined duration and open said valve only during the time of said pulse, and signalling means to cause operation of said pulse generating means, actuated by the beating or harness motion of said loom, whereby said valve operates in synchronism with said motion.

4,074,728

APPARATUS FOR SELECTIVELY INSERTING WEFT YARNS INTO THE SHED OF A WEAVING LOOM

Yukio Mizuno, Kodaira; Takeshi Kikuchi, Mitaka, and Shuichi Kojima, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Oct. 1, 1976, Ser. No. 728,540
Claims priority, application Japan, Oct. 5, 1975, 50-136162[U]
Int. Cl.[2] D03D *47/34*
U.S. Cl. 139—435 **9 Claims**



1. An apparatus for selectively inserting weft yarns into the shed in a weaving loom, comprising, in combination, a weft insertion unit including a plurality of weft shooting members each movable into a position aligned in use with a shed of a loom, weft selector cam means including at least one lobular cam rotatable about a fixed axis and formed with a plurality of cam lobe portions substantially equiangularly spaced apart from each other across bottom portions about said axis and having substantially equal radii from the axis, said bottom portions having from said axis substantially equal radii smaller than said radii of said cam lobe portions, a link mechanism operatively connecting said cam to said weft insertion unit for moving one of said weft shooting members into the position aligned with said shed when engaging one of said cam lobe portions and another weft shooting member into said position when engaging one of said bottom portions of said cam, cam actuating means operative to drive said cam to turn in a predetermined direction about said axis thereof from an angular position having one of its cam lobe portions engaged by said link mechanism into an angular position having one of its bottom portions engaged by the link mechanism or from the latter angular position into the former in each cycle of operation of the loom, weft selector signal supply means storing signals representative of a predetermined schedule in accordance with which the weft yarns are to be selectively inserted into said shed, locking means responsive to the signals delivered from said signal supply means for locking said cam actuating means in a condition inoperative to drive said cam in response to one signal from the signal supply means and releasing the cam actuating means from the inoperative condition in response to another signal from the signal supply means, cam retaining means engageable with said cam means for holding said cam in any of said angular positions of the cam when said locking means is in locking engagement with said cam actuating means, and the cam retaining means being disengaged from the cam when the cam is being rotated from one of the angular positions thereof into another.

4,074,729

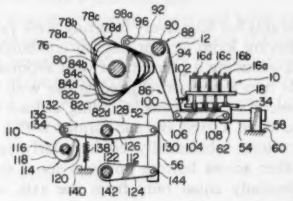
APPARATUS FOR SELECTIVELY DETAINING AND RELEASING WEFT YARNS IN WEAVING LOOM

Yukio Mizuno, Kodaira, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Oct. 1, 1976, Ser. No. 728,888
Claims priority, application Japan, Oct. 5, 1975, 50-120037
Int. Cl.[2] D03D *47/34*
U.S. Cl. 139—450 **18 Claims**

1. An apparatus for selectively detaining and releasing a

plurality of weft yarns to be drawn off into the shed of a weaving loom including control means incorporating a predetermined schedule for weft selection, comprising in combination (1) a weft retaining mechanism comprising a plurality of weft pinch-off units arranged in a row and each having a first condition operative to detain a weft yarn leading from a yarn package and a second condition allowing the weft yarn to be drawn off through the weft pinch-off unit; and weft release levers respectively in engagement with said weft pinch-off units and each rotatable about a fixed axis between first and second angular positions holding the associated weft pinch-off unit in said first and second conditions thereof, (2) a weft selector mechanism for selecting out of said plurality of weft yarns a weft yarn to be drawn off into the weaving shed under the control of said control means, the selector mechanism comprising weft selector cam means operatively connected to said control means for being driven in accordance with said predetermined schedule; weft selector link means in engagement with said cam means; lever actuating means movable with said link means between positions respectively engageable with said weft release levers, said cam means being movable between angular positions respectively holding the link means in said positions thereof; and a guide member for guiding said



lever actuating means to move between said positions thereof relative to the guide member, said guide member and said lever actuating means being movable together between first positions operative to hold each of the weft release levers in the first angular position thereof when the particular weft release lever is being engaged by said lever actuating means and second positions allowing each of the weft release levers to turn into the second angular position thereof when the particular weft release lever is being engaged by the lever actuating means, and (3) a weft release control mechanism comprising weft release control cam means rotatable about a fixed axis and having first and second angular positions for driving said particular release lever into said first and second angular positions, respectively, thereof; and weft release control link means being in engagement with said weft release control cam means and movably connected to said guide member for converting the rotational motion of said weft release control cam means into substantially linear motion and transmitting the linear motion to said lever actuating means through said guide member so that the particular weft release lever being engaged by said lever actuating means is moved into the first and second angular positions thereof in response to the first and second angular positions of said weft release control cam means.

4,074,730

WEFT-YARN DRAWING-OFF AND LENGTH-MEASURING APPARATUS OF WEAVING LOOM HAVING WEFT SELECTOR MEANS

Yukio Mizuno, Kodaira, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Sept. 10, 1976, Ser. No. 722,082

Claims priority, application Japan, Sept. 22, 1975, 50-128926; Oct. 5, 1975, 50-120036

Int. Cl.[2] D03D *47/36*

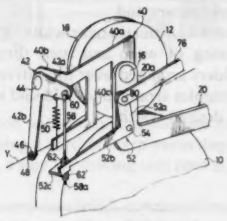
U.S. Cl. 139—452 **7 Claims**

1. - A weft-yarn drawing-off and length-measuring apparatus of a weaving loom including program-controlled weft selector means adapted to deliver a weft-change signal in accordance with a predetermined schedule, comprising:

a detachable length-measuring roller rotatable about a fixed axis, means for rotatably mounting said length-measuring roller and for mounting it removable and exchangeable with another length-measuring roller having a different diameter;

a pressing roller rotatable about an axis parallel with the fixed axis of rotation of the length-measuring roller and movable relative to the fixed axis;

a roller support mechanism including a parallelogrammic four-bar linkage for constraining said pressing roller to move substantially perpendicularly to the axis of rotation of the length-measuring roller, and biasing means for urging said four-bar linkage in a direction to hold said pressing roller in contact with the length-measuring roller, the length-measuring roller and the pressing roller being operable to pass therebetween a weft yarn when held in rolling contact with each other;



a weft guide mechanism movable with the axis of rotation of said pressing roller and having a first condition of operation for holding the weft yarn in an operative position generally perpendicularly aligned with the line of contact between the length-measuring roller and the pressing roller and a second condition of operation for holding the weft yarn out of said operative position; and

a control mechanism operatively connected to said weft selector means and including an elongated member pivotally connected to said weft guide mechanism and movable in response to said weft-change signal from said weft selector means for driving the weft guide mechanism into said first condition in the presence of said signal and into said second condition in the absence of said signal.

4,074,731

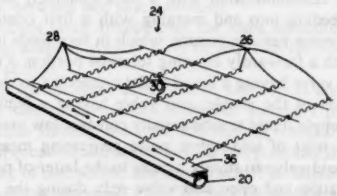
COMPLIANT MESH STRUCTURE AND METHOD OF MAKING SAME

John S. Archer, Palos Vardes Peninsula, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 484,635, July 1, 1974, Pat. No. 3,982,248. This application Dec. 29, 1975, Ser. No. 644,985

Int. Cl.[2] B21F *27/10*

U.S. Cl. 140—112 **2 Claims**



1. The method of fabricating a wire mesh of the character described comprising the steps of:

selecting first wires which are preformed to a spring-like configuration which renders the wires resiliently compliant in their endwise directions and second wires;

placing said second wires in spaced side-by-side relation; and

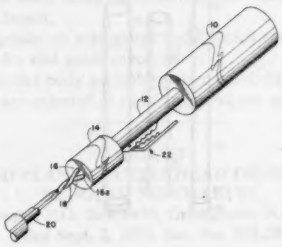
joining said first wires to said second wires to form a mesh wherein said first wires are disposed in crossing relation to and spaced along said first wires by placing each first wire in crossing relation to said second wires, exerting a tension load on the first wire to stretch the latter wire, and joining the latter wire to the second wires at the wire crossing points while the first wire is under said tension load.

4,074,732

WIRE CUTTING, STRIPPING AND TWISTING TOOL

Kenneth A. Wilkens, R.D. No. 2 Box 546, Andover, N.J. 07821

Filed Jan. 5, 1977, Ser. No. 756,898
Int. Cl.[2] B21F *15/04*
U.S. Cl. 140—120 **1 Claim**



1. A hand-held wire cutting and twisting tool comprising:

a. a generally cylindrical handle member;

b. a head member generally aligned concentrically with the axis of said handle member and spaced therefrom;

c. a face on said head member in a plane generally normal to the axis of said handle member;

d. a generally cylindrical shank concentric with said handle member connecting said handle member to said head member;

e. at least two blind holes normal to said face and parallel to the axis of said handle member, each of said at least two blind holes being symmetrically offset from the axis of said handle member;

f. each of said at least two blind holes being adapted to the insertion therein of the stripped end of one wire to be twisted;

g. said at least two blind holes, in combination with said head member, shank and handle member, being operative to twist together the stripped ends of at least two wires inserted therein when the wires are held and the handle member rotated about its axis;

h. a fixed cutting and stripping blade rigidly attached to said shank;

i. a moveable cutting and stripping blade pivotally attached at one of its ends in operatively opposed relationship to said fixed cutting and stripping blade;

j. a handle on the second end of said moveable cutting and stripping blade;

k. opposed scissors blade means on said fixed and moveable cutting and stripping blades for cutting through said wires; and

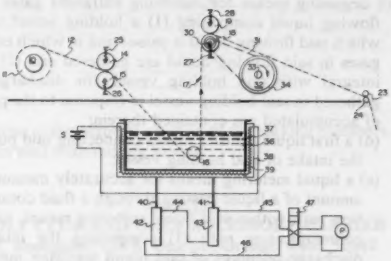
l. at least one semicircular stripping notch in each of said fixed and moveable cutting and stripping blades, said stripping notches facing each other and together forming a generally circular hole with a sharpened perimeter, said generally circular hole being slightly larger in diameter than the diameter of a wire conductor to be stripped.

4,074,733

FLEXIBLE LEAD CHLORIDE CATHODE CONSTRUCTION

Thomas J. Gray, Armdale, and Jan Wojtowicz, Dartmouth, both of Canada, assignors to The Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed June 8, 1976, Ser. No. 693,835
Claims priority, application Canada, June 16, 1975, 229399
Int. Cl.[2] H01M *7/00*
U.S. Cl. 141—32 **6 Claims**



1. Apparatus for the manufacture of flexible electrode material, which comprises:

a container for a bath of molten coating material;

means for heating and melting the coating material in the container;

first guide means for guiding a strip-shaped mesh on a path of travel extending downwardly from the first guide means;

second guide means for guiding the mesh beneath the surface of the bath;

third guide means for guiding the mesh upwardly from the second guide means and out of the bath;

means for raising and lowering the container to and from an elevated position in which the second guide means is immersed in the bath; and

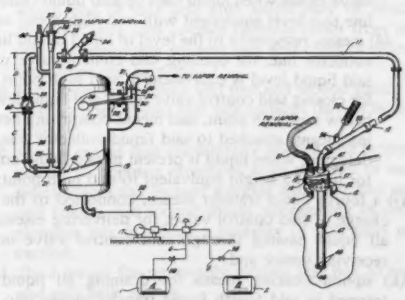
drive means for advancing the mesh past the first, second and third guide means.

4,074,734

LIQUID DELIVERY SYSTEM

Gerard Anthony De Beau, Buena Park, and Harold Arnold Price, Orange, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed July 20, 1976, Ser. No. 707,034
Int. Cl.[2] B65B *3/18*
U.S. Cl. 141—44 **3 Claims**



1. An apparatus comprising:

(1) a plurality of storage vessels for separately storing a plurality of liquids; and

(2) a liquid delivery system for transferring into a receiving vessel accurately measured amounts of any one of said stored liquids without the transferred liquid becoming contaminated in said system with a significant amount of a previously transferred liquid, said liquid delivery system comprising:

(a) a positive displacement pump;

(b) valving means, in liquid communication with said pump and each of said storage vessels, for directing the flow of a liquid in any one of said storage vessels into said pump;

(c) degassing means for removing entrained gases from a flowing liquid comprising (1) a holding vessel through which said flowing liquid is passed and in which entrained gases in said flowing liquid are gathered and (2) means, integral with said holding vessel, for discharging gas gathered in said holding vessel in response to the presence of accumulated gas contained therein;

(d) a first liquid transfer means connecting said pump and the intake of said holding vessel;

(e) a liquid metering means for accurately measuring the amount of a liquid passing through a fluid communication path within said liquid metering means, said fluid communication path (1) comprising the intake and discharge openings of said liquid metering means and (2) being constructed such that a draining liquid may freely pass through said fluid communication path without any significant amount thereof becoming entrapped therein;

(f) a second liquid transfer means connecting the discharge of said holding vessel and said intake opening of said liquid metering means;

(g) a control valve;

(h) a third liquid transfer means connecting said discharge opening of said liquid metering means with the intake opening of said control valve;

(i) means for opening said control valve when liquid is at the high point of that portion of said liquid delivery system consisting of said second and third liquid transfer means, said liquid metering means, said intake opening of said control valve, and the discharge portion of said holding vessel and for closing said control valve in response to the detection of entrained gas in liquids flowing through said second liquid transfer means, said means comprising:

(1) a gas communication passageway for discharging gases from said high point;

(2) a liquid collector line connected to said portion of said liquid delivery system, said liquid collector line extending upwardly from its connection to said portion of said liquid delivery system to a height at least equivalent to said high point;

(3) a valve, positioned in said gas communication passageway, said valve being responsive to a float situated within said liquid collector line such that said valve closes when liquid rises up said liquid collector line to a level equivalent with said high point; and

(4) means, responsive to the level of liquid in said liquid collector line, for opening said control valve when said liquid level is equivalent to said high point and for closing said control valve when said liquid level is below said high point, said means comprising detecting means, attached to said liquid collector line, for detecting when liquid is present in said liquid collector line at a height equivalent to said high point;

(j) a fourth liquid transfer means, connected to the discharge of said control valve, for delivering essentially all liquid passing through said control valve into a receiving vessel; and

(k) siphon-breaking means for draining all liquid entrapped in said fourth liquid transfer means into said receiving vessel when said control valve is closed, said siphon-breaking means comprising:

(1) an air inlet passageway connected to that portion of said liquid delivery system consisting of said discharge of said control valve and said fourth liquid transfer means;

(2) a valve situated in said air inlet passageway; and

(3) means, integral with said valve, for opening said valve when a negative pressure exerted by entrapped liquid in said fourth liquid transfer means is detected, said means including means for detecting said negative pressure.

4,074,735

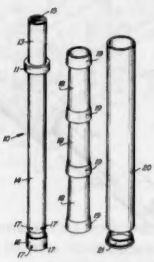
GROUTING TUBE

William E. McCabe; Howard W. McCabe, and Edwin L. McCabe, all of Idaho Falls, Idaho, assignors to McCabe Brothers Drilling, Inc., Idaho Falls, Idaho

Filed Sept. 10, 1976, Ser. No. 722,261

Int. Cl.[2] B65B *3/04*

U.S. Cl. 141—311 R **5 Claims**



1. A grouting tube for preventing backflow of grout around said tube during grouting operations, comprising in combination:

an inner tube for carrying grouting material having a reverse threaded portion on the external circumference of said tube a distance from a first end thereof;

nut means disposed about said inner tube having reverse threads for engaging said threaded portion of said inner tube;

annular retaining ring means for mounting on said second end of said inner tube;

mounting means for said annular retaining ring means on said inner tube second end, said mounting means arranged to separate upon application of a pre-determined force thereagainst;

a series of alternating multiple annular, flexible cap means and frusto-conical rigid tube means slidingly disposed along the length of said inner tube from said nut means to said annular retaining ring with said tube means spacing said multiple annular cap means predetermined distances apart from each other; and, whereby said cap means prevents backflow of grout around said inner tube

external sheath means slidingly disposed about and concentric with said cap means and said frusto-conical rigid tube means whereby said sheath means facilitates the placement of said grouting tube in a grout hole.

4,074,736

MILLING GAUGE

Robert Wolff, 1 M Kiesacker, (5446) Engeln, Germany

Filed Mar. 24, 1977, Ser. No. 780,972

Claims priority, application Germany, May 15, 1976, 2621746; Sept. 24, 1976, 2642924

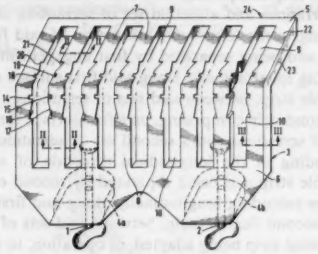
Int. Cl.[2] B27F *1/08*

U.S. Cl. 144—78 **7 Claims**

1. A milling gauge for milling dovetail grooves in boards that are to be dovetailed together at right angles by means of a milling cutter hand machine comprising:

a gauge body having a comb-like body portion provided with parallel slits and prongs;

a guide piece which is attachable to the milling cutter hand machine and is to introduce into said slits of the comb-like body portion;



said gauge body being clamped together with one board to a workbench;

counter guides on said gauge body which serve as spacing means for said guide piece; and,

said comb-like body portion has two comb-like guide plates which are oriented at right angles to one another;

4,074,737

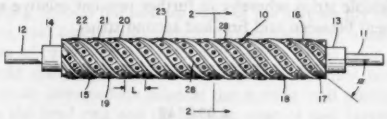
WOOD PLANER CUTTERHEAD DESIGN FOR REDUCED NOISE LEVEL

John S. Stewart, P.O. Box 5670, Greensboro, N.C. 27403

Filed Sept. 2, 1975, Ser. No. 609,291

Int. Cl.[2] B27C *1/00*

U.S. Cl. 144—117 R **9 Claims**



1. A wood planer cutterhead for reducing noise level comprising: a rotatable shaft, a cylindrical cutterhead mounted on said shaft, a series of helically mounted cutting blades mounted on said cutterhead, said cutting blades being spaced circumferentially on said cutterhead and positioned to simultaneously engage a surface to be cut to reduct noise level, the spacing between said cutting blades being in accordance with the formula $L=\pi D\cot\phi/N$ in which L is the linear distance between adjacent helical cutting blades, D is the cutterhead diameter, N is the number of cutting blades and ϕ is the helix angle, and the ratio of W/L, in which W is the width of the workpiece, is greater than 1.

4,074,738

ARRANGEMENT FOR A ROTOR BARKING MACHINE

Veikko Lennart Valo, Hiidensalmi, 08100 Lohja 10, Finland

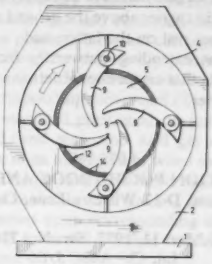
Filed Mar. 22, 1977, Ser. No. 780,152

Claims priority, application Finland, Apr. 2, 1976, 760896

Int. Cl.[2] B27L *1/00*

U.S. Cl. 144—208 E **3 Claims**

1. An arrangement for a rotor barking machine comprising a hollow rotor rotatably mounted in a frame, barking members pivotally journalled on the rotor and directed toward the centre of a rotor, a cutting member supported by the frame and extending close to the plane of rotation of the barking members for cutting-off of back strips, and means for feeding a tree to be barked longitudinally through the hollow rotor, said cutting member comprising a non-rotating tubular portion extending into the opening in the hollow rotor, the end edge of said portion extending from the inside of the opening in the hollow



rotor close to the plane of rotation of the barking members and being formed with cutting means.

4,074,739

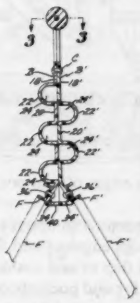
GOLF CLUB AND GOLF ACCESSORY CARRIER

John H. Rodeghier, 255 S. Oak St., Orange, Calif. 92667

Filed Feb. 17, 1977, Ser. No. 769,316

Int. Cl.[2] A63B *55/00*

U.S. Cl. 150—1.5 B **5 Claims**



1. A carrier for golf clubs and golf accessories for use on a par-three golf course, said carrier including:

a. first and second equally sized elongate panels only, each of said panels having first and second end edges, and first and second side surfaces, said first side surfaces being at least partially flat and in abutting contact, said second surfaces at least partially defined by a plurality of longitudinal, laterally spaced corrugations, and each of said corrugations cooperating with a part of said flat side surface oppositely disposed thereto to define an elongate cavity in which one of said golf club shafts may be removably disposed, with said cavities laterally offset from one another to removably support said golf clubs in offset positions from one another;

b. first means for holding said first and second panels and at least portions of said first side surfaces thereof in abutting contact;

c. second means that are laterally aligned and project outwardly in opposite directions from portions of said first side surfaces and formed integral with said first and second panels, said second means cooperating to define an elongate box in which a plurality of golf balls may be carried;

d. third means for removably closing said box to maintain said golf balls therein;

e. first and second laterally aligned legs pivotally supported from said first and second panels intermediate said first and second end edges thereof, said legs when in a first position extending longitudinally relative to said first and

second panels and adjacent thereto, said first and second legs when in a second position extending outwardly from said first and second panels in angularly disposed positions to support said carrier above the ground surface when said first end edges rest on the latter; and

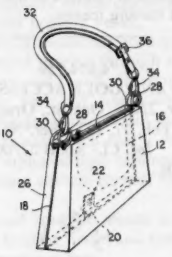
f. fourth means extending outwardly from said first and second panels that cooperate to define a handle for carrying said carrier.

4,074,740

COMBINATION POCKETBOOK AND CUSHION

Margaret Anderson, D-11 Wilshire Lane, Oakdale, L.I., N.Y. 11769

Filed Mar. 11, 1977, Ser. No. 776,531
Int. Cl.[2] A45C *3/06*
U.S. Cl. 150—35 **5 Claims**



1. A combination pocketbook and cushion construction comprising:

a pocketbook having a flap pivotably connected to one side thereof,

a ring on opposite edges of said pocketbook

a cushion

a pair of rings connected to opposite edges of said cushion

means on the bottom edges of said flap and said cushion for connecting said flap to said cushion, and

a carrying handle for said pocketbook and cushion including fastening means connected to opposite ends of the handle for connecting said handle to said rings on both said pocketbook and said cushion.

4,074,741

ANTI-SKID TIRE CHAIN

Clifton Ross Moore, and John Greydon Moore, both of Suite 215 Duke Towers, Halifax, Nova Scotia, Canada

Filed July 15, 1975, Ser. No. 579,611
Int. Cl.[2] B60C *27/02*
U.S. Cl. 152—237 **9 Claims**

1. An anti skid device adapted to be mounted on a tire and comprising, in combination:

a single strand of link chain;

a first strip of flexible material removably connected, at one end thereof, to one end of said link chain;

a second strip of flexible material removably connected, at one end thereof, to the other end of said link chain;

said first and second strips being of unequal length;

said first strip comprising, on a first surface thereof, a first set of serrations and a second set of serrations, said sets extending in the longitudinal direction of said first flexible strip and being separated by first engagement means extending longitudinally along said first surface of said first flexible strip, between said sets of serrations;

said second strip comprising, on a first surface thereof, a first set of serrations and a second set of serrations, said sets extending in the longitudinal direction of said second flexible strip and being separated by second engagement means extending longitudinally along said first surface of said second flexible strip, between said sets of serrations;

said second strip being adapted, in operation, to overlie said first strip such that the first surface of the first strip faces the first surface of the second strip;

whereby the serrations of said first strip interlock with the serrations of said second strip to thereby prevent movement of one strip relative to the other strip in the longitudinal directions of the strips;

and whereby said first engagement means matingly engages said second engagement means to prevent lateral movement of the strips relative to one another;

said first strip, in operation, lying adjacent said tire with the second surface thereof facing said tire, said second surface of said first strip comprising ridges extending transversely thereof at regular intervals in the longitudinal direction of said first strip;

whereby movement of said device along said tire is prevented;

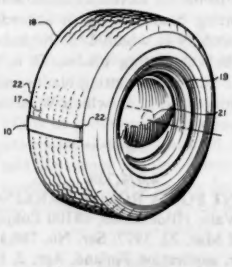
and clasp means fitting over the interlocked first and second flexible strips whereby to further prevent relative movement between said first and second strips.

4,074,742

INDICATOR FOR TIRE WEAR PATTERNS

Kenneth Donald Chamblin, 4219 Arcturus Ave., Lompoc, Calif. 93436

Filed Sept. 27, 1976, Ser. No. 727,297
Int. Cl.[2] B60C *11/00*
U.S. Cl. 152—330 A **6 Claims**



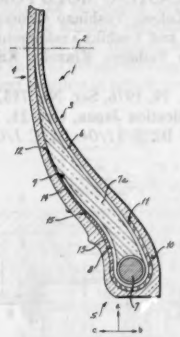
6. For use on a vehicle tire to determine wear patterns, an adhesive strip having multilayers of different colors and having a thickness on the order of several thousandths of an inch and for adhering transversely to the tread of a tire, said strip readily revealing tread wear patterns of the tire prior to adverse tire tread wear upon differential wear of parts of the strip to reveal different colors whereby said strip results in a strip having a bulk so small that the roundness of the tire is maintained and bumping avoided, and the strip mass being so small that wheel balance is substantially maintained.

4,074,743

RADIAL TIRE WITH BEAD REINFORCING ELEMENTS

Sjirk van der Burg, Embourg, Belgium; Karl A. Grosch, Roetgen (Rott), Germany, and Marcel J. Bertrand, Grivegnee-Liege, Belgium, assignors to Uniroyal, AG, Aachen, Germany

Filed Oct. 9, 1975, Ser. No. 620,971
Claims priority, application Germany, Nov. 25, 1974, 2455709
Int. Cl.[2] B60C *9/00*
U.S. Cl. 152—355 5 Claims



1. In a motor vehicle pneumatic tire having an inner wall portion and an outer wall portion with a bead ring disposed therebetween and a radial carcass having a turn-up portion folded about the bead ring from the inner wall portion toward the outer wall portion for termination in a turn-up edge, a bead reinforcement folded about the bead ring and the carcass ply turn-up portion from the inner wall portion to the outer wall portion and having a first terminal edge at the inner wall portion and a second terminal edge at the outer wall portion extending beyond the turn-up edge of the carcass ply turn-up portion, said bead reinforcement further including a main ply portion of predetermined thickness having a first cord material, said main ply portion extending from the first terminal edge to an intermediate edge at the outside wall portion between the bead ring and the turn-up edge of said carcass ply with cord ends of said first cord material being at said intermediate edge, and a terminal ply portion of lesser thickness than said main ply portion and having a second cord material of lesser stiffness than said first cord material, said terminal ply portion abutting against the intermediate edge of said main ply portion and extending from said intermediate edge to said second terminal edge thereby covering at least a portion of the intermediate edge to shield the cord ends in said edge portion from the outer wall portion of said tire, and wherein a filler strip is disposed at the abutting main and terminal ply portions of said bead reinforcement such that the thickness of the filler strip and the terminal ply portion are substantially equivalent to the thickness of the main ply portion to provide a substantially continuous transition between the main and terminal ply portions of the bead reinforcement along the radial carcass at the area of abutment.

4,074,744

AUTOMATIC APPARATUS FOR PRODUCING MOLDS USING CHEMICALLY BONDED SANDS

Ronald A. Cina, and Albert D. Kluge, both of Lansing, Mich., assignors to Roberts Corporation, Lansing, Mich.

Filed Jan. 31, 1977, Ser. No. 763,813
Int. Cl.[2] B22C *15/28*
U.S. Cl. 164—187 5 Claims

1. An automatic mold machine for producing molds using chemically bonded sands comprising:

a mold machine frame;

blow head means provided at the uppermost portion of said frame;

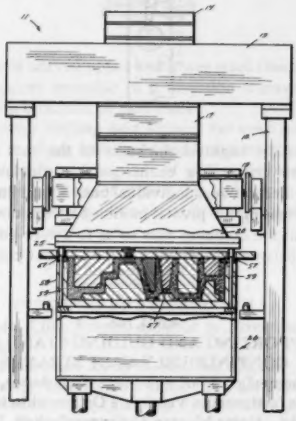
bulk sand delivery means in association with said frame;

carriage means provided on said frame, said carriage means adapted to selectively shuttle between and below said blow head means and said bulk sand delivery means;

a sand magazine positioned on said carriage means, said sand magazine adapted for selectively positioning below said blow head means and said bulk sand delivery means upon selective corresponding movement of said carriage means;

a gas catalyst manifold positioned on said carriage means adjacent said sand magazine, said gas catalyst manifold adapted to be in an idle position when said sand magazine is positioned below said blow head means, said gas catalyst manifold movable to a gassing position below said blow head means upon corresponding movement of said sand magazine to its fill position beneath said bulk sand delivery means;

a pattern clamp table provided in spaced-apart register below said blow head means, said pattern clamp table having a pattern tooling stack positioned thereon, said



pattern clamp table adapted to selectively clamp said pattern tooling stack against said sand magazine and said blow head means during the mold blow operation and to selectively clamp said pattern tooling stack against said gas catalyst manifold during a mold squeeze and gas catalyst operation;

mold squeeze compression assembly means in association with said pattern tooling stack and said clamp table so as to permit selectively maintaining said blow head means and said clamp table in non-compressive relationship during the blow operation and permitting compression of the blown sand mold after the blow operation and before the gassing operation through a compressive relationship between said clamp table and said gas catalyst manifold; and

mold ejection assembly means provided in association with said frame, said mold ejection assembly means adapted to remove the cured sand mold from the automatic mold machine.

4,074,745

STARTER BAR FOR GUIDING AND EXTRACTING CAST STRANDS OF VARIOUS THICKNESSES

Werner Scheurecker, and Alois Scheinecker, both of Linz, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jan. 7, 1977, Ser. No. 757,466
Claims priority, application Austria, Jan. 16, 1976, 266/76
Int. Cl.[2] B22D *11/08*
U.S. Cl. 164—446 5 Claims

1. In a starter bar for guiding and extracting cast strands of

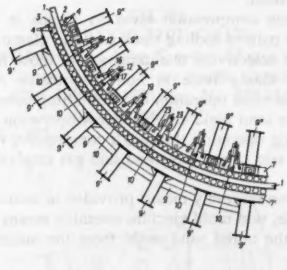
various thicknesses in continuous casting plants with arcuate guiding paths that support the cast strands at opposite sides thereof, the starter bar being formed by link bodies pivotally connected to one another about common axes so as to be arranged one behind the other and having a thickness corresponding to the slightest thickness of the cast strands, the improvement comprising exchangeable articulation locking pieces provided between individual ones of said link bodies for adjustably limiting the pivotal motion between connected link bodies about the common axes so as to assure guiding of the starter bar between the guiding paths without play.

4,074,746

SUPPORTING AND GUIDING STAND FOR CONTINUOUSLY CAST STRANDS

Werner Scheurecker, Linz, and Franz Kagerhuber, Traun, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Nov. 3, 1976, Ser. No. 738,362
Claims priority, application Austria, Nov. 12, 1975, 8601/75
Int. Cl.[2] B22D *11/12*
U.S. Cl. 164—442 **9 Claims**



1. In an arc-shaped supporting and guiding stand for continuously cast strands of the type including supporting rollers forming oppositely arranged roller paths to support the strand and uninterrupted longitudinal carriers formed in one piece for accommodating said supporting rollers, the improvement comprising:

transverse carriers arranged along the uninterrupted longitudinal carriers parallel to the axes of the supporting rollers at a distance from one another and outside a space defined by the oppositely arranged roller paths;

supporting brackets connected to said transverse carriers and being arranged laterally of the longitudinal carriers;

driven rollers journaled on said transverse carriers via said supporting brackets; and

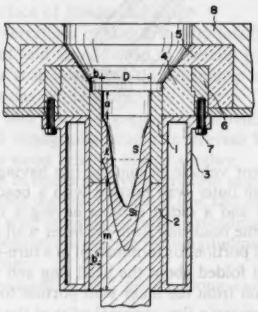
adjustment means provided for moving said supporting bracket so as to adjust said driven rollers to the strand or to a starter bar passed between the oppositely arranged roller paths in a direction toward or way from the respective oppositely arranged roller path.

4,074,747

CONTINUOUS CASTING MOLD FOR METALS

Hirohiko Takahashi, Tokyo; Yoshinao Otsuka, Toyama; Yuichiro Sato, Toyama, and Yoshiki Tsukamoto, Toyama, all of Japan, assignors to Taiheiyo Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1976, Ser. No. 715,657
Claims priority, application Japan, Oct. 21, 1975, 50-125904
Int. Cl.[2] B22D *11/04*; B22C *1/00*
U.S. Cl. 164—443 **5 Claims**



1. A continuous casting mold for metals having a large difference between the melting temperature and the solidifying temperature thereof, said casting mold being an open mold having an inlet end and an outlet end and said inlet end being directly connected to a pouring basin, comprising a 1st stage die portion of refractory material other than graphite, a 2nd stage die portion of a graphite type refractory material, and a water-cooling jacket, said 1st stage die portion being in the water-cooling jacket at the inlet side for a length longer than one drawing length and said 1st stage die portion in the water-cooling jacket at the inlet side extending beyond the back end of said water-cooling jacket into the pouring basin side for a length longer than the thickness of said 1st stage die portion, and said 2nd stage die portion being in the mold at the outlet side thereof and having a length of 1–4 times the length of said 1st stage die portion.

4,074,748

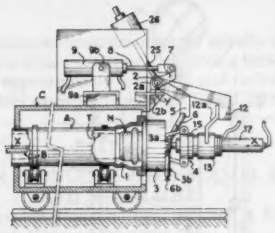
CENTRIFUGAL CASTING MACHINE HAVING A DEVICE FOR AXIALLY PLACING AND MAINTAINING A CORE IN POSITION

Robert Paul Négre, Fumel, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed Oct. 31, 1975, Ser. No. 627,816
Claims priority, application France, June 16, 1975, 75 18770
Int. Cl.[2] B22D *13/10*
U.S. Cl. 164—292 **10 Claims**

1. A centrifugal casting machine comprising a housing, an open-ended pouring mould mounted to rotate in the housing about an axis, and a device for axially placing and maintaining a core against the open end of the mould, said device comprising a hollow thrust element, first support means carrying the thrust element and movably mounted relative to the housing so as to permit moving the thrust element between an operative position in which position the hollow thrust element maintains the core against the open end of the mould and allows the

inside of the mould to be seen and a withdrawn position in which withdrawn position the thrust element is located laterally to one side of the open end of the mould to allow unhindered access to the open end of the mould, a releasable mechanism capable of engaging the core and holding the core against the thrust element when the the thrust element is in said withdrawn position and while the thrust element moves from said withdrawn position to said operative position, means mounted relative to the housing and connected to the first support means for shifting the thrust element between said operative withdrawn position and said withdrawn position, second support means carrying the releasable mechanism and movably mounted relative to the housing and independent of and movable independently of the first support means and transversely of the mould axis so as to permit moving the releasable mechanism between a first position in which position it holds the core



against the thrust element in the operative position of the thrust element and a second position in which second position the mechanism is located laterally to one side of the open end of the mould to allow unhindered access to the open end of the mould and through the hollow thrust element when the thrust element is in said operative position, and returning means connected to the second support means for returning the releasable mechanism to said second position, the releasable mechanism being capable of being disengaged from the core when the thrust element is in said operative position and capable of being thereafter moved by said returning means acting on said second support means from said first position to said second position while the thrust element remains in said operative first position, the mechanism being capable, in moving from said second position to said first position, of following the movement of the thrust element from said withdrawn position to said operative position of the thrust element.

4,074,749

CASTING MACHINE WITH MOLD TILTING DISCHARGE MEANS

Akira Otani, Kobubunji, Japan, assignor to Tanabe Kokoki Co., Ltd., Itoigawa, Japan

Continuation of Ser. No. 695,136, June 11, 1976, abandoned. This application Jan. 13, 1977, Ser. No. 759,098

Claims priority, application Japan, June 13, 1975, 50-71566

Int. Cl.[2] B22D *5/02, 29/00*

U.S. Cl. 164—326 **10 Claims**

1. A casting machine comprising:

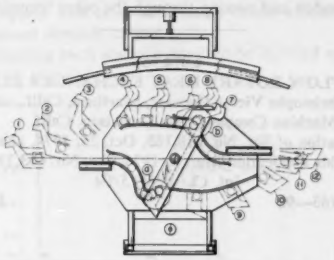
a truck;

means for driving said truck in an advancing direction;

a plurality of molds carried by said truck, said molds being aligned in the advancing direction and being rotatable about axes extending perpendicular to the advancing direction, each mold having a rearwardly extending lip which overlaps the forward edge of the next succeeding mold when the molds are horizontally arranged;

arms connected to each of said molds for rotation therewith, said arms having first and second guide rollers which in relation to the advancing direction of said truck, are spaced respectively forwardly and rearwardly of the rotational axis of the mold to which the arm is connected;

guide means adjacent to the path of travel of said truck in the advancing direction for cooperating with said rollers to control the rotational attitude of said molds, said guide means having horizontal sections which maintain said molds horizontally, and curved sections which rotate said molds about said axes in order to discharge the contents thereof at a casting discharge position, said curved sections including curved upper and lower tracks, said first guide rollers being engageable with said lower tracks and said second guide rollers being engageable with said upper



tracks, said curved upper and lower tracks being mounted on a support movable in a direction transverse to the advancing direction of said truck;

and, means for shifting said support between an operative position at which said upper and lower tracks are aligned with the horizontal sections of said guide means, and an inoperative position at which the said upper and lower tracks are not engaged by the rollers on said arms during movement of said truck.

4,074,750

INTERNALLY COOLED ROLL

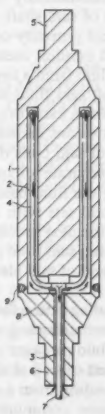
Marcel Beghin, Lille, France, assignor to Fives-Cail Babcock, Paris, France

Filed Mar. 25, 1976, Ser. No. 670,128

Claims priority, application France, Mar. 28, 1975, 75 09836

Int. Cl.[2] F28F *5/02*

U.S. Cl. 165—89 **9 Claims**



1. An internally cooled roll comprising

(1) a cylindrical body having an axis and two coaxial trunnions, one of the trunnions constituting an integral piece with the body and the other trunnion being affixed thereto, the body defining in the interior thereof

(2) a longitudinal conduit extending in the direction of the axis for circulating a cooling fluid therethrough, the conduit being closed to an end on the side of the one trunnion,

(2) a tubular conduit disposed in the longitudinal conduit and extending over most of the length of the longitudinal conduit whereby the tubular conduit is surrounded by the longitudinal conduit, and

(3) means for supplying the cooling fluid to one of the conduits and removing the fluid from the other conduit, the fluid flowing through the conduits in opposite directions, said means including

(a) a fluid collector element connected to the tubular conduit and passing through the other trunnion.

4,074,751

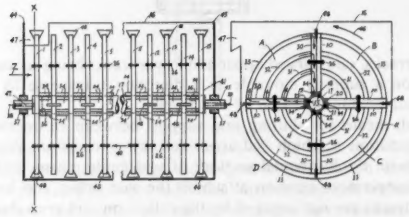
MULTIFLOW ROTARY HEAT EXCHANGER ELEMENT

Joseph Christophe Victor Ducasse, Martinez, Calif., assignor to Unice Machine Company, San Francisco, Calif.

Continuation of Ser. No. 518,163, Oct. 25, 1974, abandoned. This application Mar. 3, 1976, Ser. No. 663,224

Int. Cl.[2] F28F *5/04*

U.S. Cl. 165—92 **15 Claims**



1. A multiflow rotary heat exchanger element comprising:

a rotatably mounted longitudinal shaft;

a plurality of coil sets fixedly positioned to said shaft at spaced intervals along the length thereof;

each of said coil sets being formed of an equal plurality of separate equally configured coils, each of said coils of each set being in the form of a circular sector, each of said coils having extending therethrough a fluid passage including first and second radial portions joining at least one circumferential portion, all of said coils of each said coil set being arranged substantially in a plane transverse to the longitudinal axis of said shaft;

a plurality, equal to said plurality of coils in each said coil set, of separate fluid conduit means for supplying plural separate streams of fluid from a first end of said element to a second end thereof, said fluid conduit means being entirely fluid isolated from each other;

each said fluid conduit means including the fluid passage of a selected one only of said coils of each of said coils sets, and a plurality of separate channels, one each of said channels connecting the fluid passage of the said selected coil of one of said coil sets with the fluid passage of the said selected coil of the next successive coil set, said channels serially connecting said fluid passages of said selected coils from said first end of said element to said second end thereof;

fluid inlet means extending into a first end of said shaft, said fluid inlet means communicating with the first radial portion of each of said fluid passages of the coils of the coil set adjacent said first end of said shaft;

fluid outlet means extending from a second end of said shaft, said fluid outlet means communicating with the second radial portion of each of said fluid passages of the coils of the coil set adjacent said second end of said shaft;

the separate channels of each of said separate fluid conduits connecting the second radial portion of the fluid passage of the respective selected coil of each coil set with the first radial portion of the fluid passage of the respective selected coil of the next downstream coil set, taken in the direction of flow of fluid from said first end of said shaft to said second end thereof; and

said coils in the form of circular sectors being positioned such that corresponding sectors of each of said coil sets are aligned longitudinally of said shaft, the adjacent selected and connected coils of each of said separate fluid conduits being sequentially circumferentially displaced with respect to each other, and the circumferential displacement of said selected and connected coils being in a direction opposite to the direction of rotation of said shaft.

4,074,752

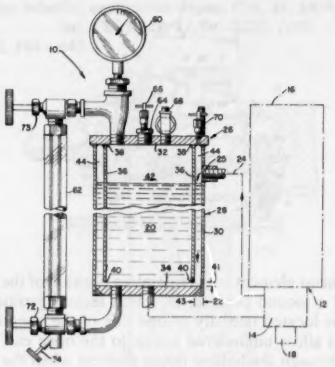
LUBRICANT COOLING APPARATUS

Seymour Schlosberg, East Brunswick, N.J., assignor to R. Gelb & Sons, Inc., Union, N.J.

Filed Dec. 22, 1975, Ser. No. 643,480

Int. Cl.[2] F01M *5/00;* **F28F** *27/00*

U.S. Cl. 165—96 **24 Claims**



1. An apparatus for circulating and cooling a liquid medium utilized for lubricating an external device, comprising a housing having means defining an internal lubricant reservoir and including at least one peripheral outer sidewall, axially spaced upper and lower end wall portions, a cooling chamber disposed about at least a portion of the internal reservoir and within the housing, said means defining said reservoir being formed such that said chamber is in fluidic communicating relation with the internal reservoir said chambers being formed at least in part by said outer peripheral sidewall such that heat is transferable from within said cooling chamber to an atmosphere outside of the housing, lubricant return means connected to an upper portion of said peripheral sidewall and operatively communicating with said cooling chamber for directing relatively hot lubricating liquid from an external device to said cooling chamber, lubricant feed means operatively connected to a lower portion of said housing to enable relatively cooled lubricating liquid flowing downwardly within said cooling chamber to return to an external device to provide further lubrication thereof, and means for introducing a gaseous medium under relatively elevated pressures into said reservoir to raise the lubricating liquid in the cooling chamber to a level sufficient to enable adequate heat transfer to take place from the lubricating liquid returning to said cooling chamber from an external device, said lubricating liquid being circulated by natural convection in a closed liquid system.

4,074,753

HEAT TRANSFER IN POOL BOILING

Karl V. Schmittle, and Keith E. Starner, both of York, Pa., assignors to Borg-Warner Corporation, Chicago, Ill.

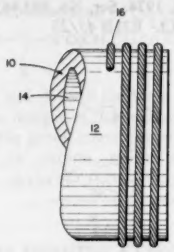
Division of Ser. No. 538,234, Jan. 2, 1975, abandoned. This application July 23, 1976, Ser. No. 707,974

Int. Cl.[2] F28F *13/02, 1/36*

U.S. Cl. 165—184 **2 Claims**

1. In a heat exchanger adapted for use in a pool boiling application wherein a relatively low boiling point liquid is

caused to boil on the outside surface of a plurality of heat exchange tubes totally immersed in said liquid, each said tube comprising an elongated, tubular metal substrate and a length



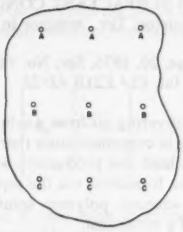
of fibrous, multifilament funicular material spirally wound on the outside surface of said substrate, the spacing between adjacent turns being approximately 0.01 inch, said funicular material having an outer diameter between 0.01 and 0.02 inches.

4,074,754

METHOD FOR PRODUCING GEOTHERMAL ENERGY AND MINERALS

Lawrence D. Christian, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Sept. 27, 1976, Ser. No. 727,210
Int. Cl.[2] E21B *43/00, 43/24*
U.S. Cl. 166—245 **12 Claims**



1. A method for producing geothermal energy and/or minerals from subterranean high temperature, high salinity brine reservoirs comprising the steps of:

injecting fresh or low salinity water into said reservoir and into contact with said reservoir brine;

halting said injection of said fresh or low salinity water; and

producing said injected water from said reservoir, said reservoir heat heating said injected water in said reservoir.

4,074,755

ION EXCHANGE CONTROLLED CHEMICALLY AIDED WATERFLOOD PROCESS

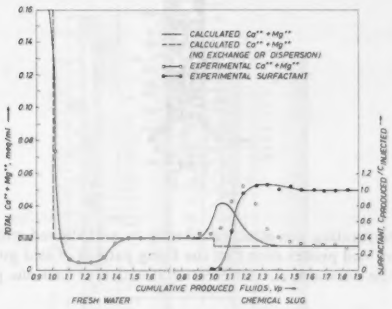
Harold J. Hill; Joseph Reisberg; Fred G. Helfferich; Larry W. Lake, all of Houston, and Gary A. Pope, Austin, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 21, 1977, Ser. No. 779,663
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—252 **3 Claims**

1. In an oil recovery process in which liquids are successively injected into an oil-containing reservoir, where the injected liquids include at least an aqueous-drive liquid and a chemical slug that contains at least one aqueous surfactant or thickened aqueous liquid for which a specific cationic composition is selected, and where the reservoir into which the liquids are injected has a significant ion-exchange capacity and contains an aqueous liquid having a cationic composition differing in proportion or type of monovalent or divalent cation, from the cationic composition selected for at least one aqueous liquid component of the chemical slug, and where each injected liquid contacts and displaces an aqueous liquid and/or oil within the reservoir, the improvement which comprises:

determining a ratio of concentrations of effectively predominant cations within the aqueous liquid in the reservoir at the time the oil recovery process is initiated, which ratio is at least substantially equivalent to the ratio of concentration of the effectively predominant monovalent cation to the square root of concentration of the effectively predominant divalent cation;

compounding each aqueous liquid to be injected so that the


CALCULATED Ca++ + Mg++
CALCULATED Ca++ + Mg++ (NO EXCHANGE OR DISPERSION)
EXPERIMENTAL Ca++ + Mg++
EXPERIMENTAL SURFACTANT
TOTAL Ca++ + Mg++, meq/ml
SURFACTANT CONCENTRATION PRODUCED, C/C INJECTED
CUMULATIVE PRODUCED FLUIDS, Vp
FRESH WATER
CHEMICAL SLUG

ionic composition of the compounded liquid provides properties selected for that liquid and the cationic composition of the compounded liquid provides a ratio of concentrations of the effectively predominant cations which ratio value substantially matches that of such a ratio within the liquid to be contacted and displaced by the compounded liquid within the reservoir; and

injecting the compounded liquids into the reservoir so that their cationic compositions minimize the amount by which the cationic compositions selected for the aqueous liquid components of the chemical slug are changed by an exchange of ions between those liquids and the reservoir rocks.

4,074,756

APPARATUS AND METHOD FOR WELL REPAIR OPERATIONS

Claude E. Cooke, Jr., Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Jan. 17, 1977, Ser. No. 759,941
Int. Cl.[2] E21B *33/13, 43/119, 47/06*
U.S. Cl. 166—253 **15 Claims**

1. An apparatus adapted to be lowered into a well for locating and perforating into a flow channel located outside the well casing which comprises:

temperature sensing means adapted to measure a temperature distribution around the circumference of said casing at a given vertical depth, thereby detecting said flow channel;

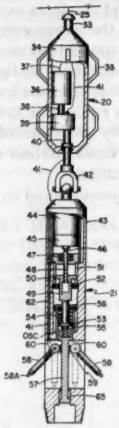
a perforating gun directly attached to, and having a fixed angular orientation with respect to said temperature detecting means; and

means for firing said gun with said gun oriented generally in the direction of said flow channel.

9. An apparatus adapted to be lowered into a cased well for perforating into a flow channel behind casing, the apparatus comprising:

a rotatable temperature sensing assembly including at least two diametrically arranged probes for detecting temperature differences on the wall of said casing at diametrically opposite locations at about the same vertical depth in said

well, thereby indicating the circumferential direction of said channel; and



a perforating gun attached directly to, and aligned with, one of said probes such that the firing pattern of said gun is in the outward, circumferential direction of said one probe.

4,074,757

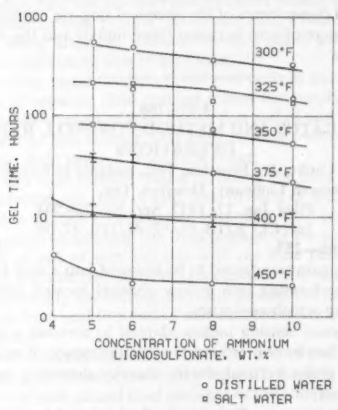
METHOD USING LIGNOSULFONATES FOR HIGH-TEMPERATURE PLUGGING

Betty J. Felber; Dwight L. Dauben, and Richard E. Marrs, all of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 710,963, Aug. 2, 1977, abandoned, which is a continuation-in-part of Ser. No. 592,849, July 3, 1975, abandoned. This application May 9, 1977, Ser. No. 795,341

Int. Cl.[2] E21B *33/138, 43/24*

U.S. Cl. 166—261 **12 Claims**



12. A method for plugging permeable zones of a wellbore at temperatures in excess of 250° F involving the steps of introducing in the permeable zone to be plugged an aqueous gel-forming solution of a water-soluble lignosulfonate containing from about 2 to about 20 weight percent reducing sugars wherein said solution is capable of gelation at temperatures in excess of 250° F, with a characteristic gel time from about 1 to about 2000 hours, and said solution being in an amount sufficient to flow into said permeable zone, and allowing said solution to set in said permeable zone to form a gel therein, thereby plugging said permeable zone.

4,074,758

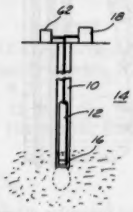
EXTRACTION METHOD AND APPARATUS

Harold W. Scott, Ridgefield, Conn., assignor to Oil Recovery Corporation, New Haven, Conn.

Filed Sept. 3, 1974, Ser. No. 502,661

Int. Cl.[2] E21B *43/25*

U.S. Cl. 166—249 **9 Claims**



1. A method of recovering oil from a well hole in oil bearing soil comprising: generating an electrohydraulic shock wave in a liquid in said well hole by capacitor discharge means, said means including a spark gap apparatus; directing the generated shock wave outwardly through the liquid from the well hole and into the bearing soil to cause oil in said soil to be separated therefrom by reducing the tension which exists between said oil and said soil; and removing said separated oil through the well hole.

4,074,759

OIL RECOVERY PROCESS USING A POLYMER SLUG WITH TAPERED SURFACTANT CONCENTRATION

Issam S. Bousaid, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Sept. 20, 1976, Ser. No. 724,678

Int. Cl.[2] E21B *43/22*

U.S. Cl. 166—273 **8 Claims**

1. A method of recovering oil from a subterranean oil-bearing formation having in communication therewith at least one injection well and at least one production well comprising:

a. injecting into the formation via the injection well a slug comprising an aqueous polymer solution containing a small amount of a surfactant,

b. injecting water into the formation via the injection well; and

c. recovering oil from the formation via the said production well and wherein the concentration of the surfactant in the said slug is increased as the slug is injected into the said formation, and wherein the water injected in step (b) contains a small amount of a solubilizing agent selected from the group consisting of:

a. a compound of the formula:

$$R-\underset{\displaystyle R''}{\overset{|}{N}}-R'O(CH_2CH_2O)_mA$$

wherein R is alkyl of from 1 to about 16 carbon atoms; wherein R′ is alkylene of from 2 to 4 inclusive carbon atoms; *m* is an integer of from 4 to about 60, A is selected from the group consisting of hydrogen, sodium, potassium and the ammonium ion and wherein R″ is selected from the group consisting of hydrogen, alkyl of from 1 to about 16 carbon atoms and

$$-R'O(CH_2CH_2O)_m\,A;$$

b. a sulfated compound of the formula:

$$R-\underset{\displaystyle R''}{\overset{|}{N}}-R'O(CH_2CH_2O)_mSO_3A$$

wherein R, R′, *m* and A have the same meaning as in (a) above, and R″ is selected from the group consisting of hydrogen, alkyl

of from 1 to about 16 carbon atoms and

$$-R'O(CH_2CH_2O)_m\ SO_3\ A,$$

and

c. a sulfonated compound of the formula:

$$R-\underset{\displaystyle R''}{\overset{\displaystyle |}{N}}-R'O(CH_2CH_2O)_nCH_2CH_2SO_3A$$

wherein R, R′ and A have the same meaning as in (a) above; wherein *n* is an integer of from about 4 to about 60 and R″ is selected from the group consisting of hydrogen, alkyl of from 1 to about 16 carbon atoms and

$$-R'O(CH_2CH_2O)_n\ CH_2CH_2SO_3\ A.$$

4,074,760

METHOD FOR FORMING A CONSOLIDATED GRAVEL PACK

Claude T. Copeland, Tulsa, and Vernon G. Constien, Owasso, both of Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 1, 1976, Ser. No. 737,813
Int. Cl.² E21B *43/04*
U.S. Cl. 166—276 **21 Claims**

1. A method of forming a permeably consolidated particulate mass in communication with a permeable subterranean formation which comprises:

(a) forming a pumpable slurry by mixing together in a sequence and respective quantities effective to form a pumpable slurry which can be cured to form a permeable but consolidated particulate mass;

an epoxy resin-solvent mixture, a curing agent, a coupling agent, an aqueous carrier liquid, a particulate, and a surfactant selected from the group consisting of quaternary ammonium salts corresponding to the formula

$$\left[\begin{array}{c} R_1 \\ | \\ R_4-N-R_2 \\ | \\ R_3 \end{array}\right]^{+} X^{-}$$

wherein: R_1 and R_3 are each independently lower alkyl, hydroxy substituted lower alkyl, or polyoxyethylene alkyl of the formula $-(CH_2CH_2O)_nH$ wherein *n* is 2 or 3; R_2 is an 8- through 18-carbon hydrocarbon chain; R_4 is an aliphatic hydrocarbon chain or an alkyl aryl group, containing 7 to 18 carbon atoms; and X is fluorine, chlorine, bromine, or iodine;

(b) introducing said slurry through a well bore and into communication with said permeable formation; and

(c) curing said slurry in place to form a consolidated permeable mass.

4,074,761

DRILLING TOOL

James D. Mott, Houston, Tex., assignor to Hydril Company

Filed Dec. 27, 1971, Ser. No. 212,260
Int. Cl.² E21B *43/00, 41/00*
U.S. Cl. 166—315 **29 Claims**

18. A method of operating a safety valve connected in a well tubing for controlling flow of fluid in an undesired direction through the bore of a well tubing, including the steps of:

sensing the pressure in the bore of the well tubing for enabling flow in the desired direction through the bore;

sensing the pressure adjacent the exterior of the safety valve;

comparing the pressure in the bore with the pressure adjacent the exterior of the safety valve to determine the pressure differential;

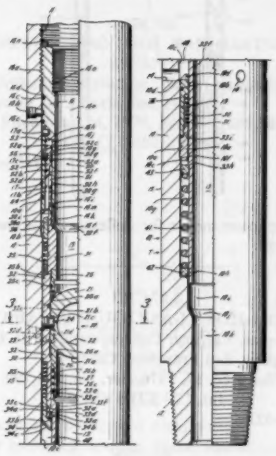
rotating a flow blocking member for opening the safety valve to enable flow of fluid through the bore of the tubing when the pressure in the bore of the tubing exceeds the pressure adjacent the exterior of the safety valve by a predetermined value;

spacing the rotatable flow blocking portion of the safety valve from a safety valve seat prior to the step of rotating open the flow blocking portion of the safety valve; and moving the flow blocking member back into engagement with the seat when the flow blocking member is rotated open.

27. A ball-type valve tool apparatus for use in wells, including:

a tubular member having a bore therethrough;

a seat disposed in said bore;



a ball-type valve member disposed in said bore and having an opening therethrough, said ball-type valve member rotatable to and from an open position for enabling flow of fluid through said bore and said opening and a closed position in sealing engagement with said seat for blocking flow of fluid through said bore of said tubular member;

means operably connected with said ball-type valve member for rotating said ball-type valve member to and from the open and closed positions; and

means for spacing said ball-type valve member from said seat prior to commencing to effect rotation of said ball-type valve member to the open position to equalize the fluid pressure in said bore about said ball-type valve member.

4,074,762

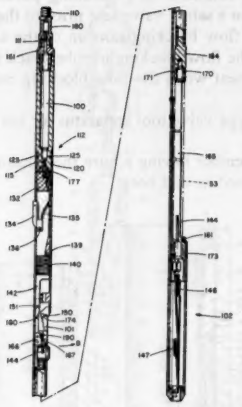
WIRELINE RUNNING TOOL

William H. Parker, Hurst, Tex., and Lawrence Hart, College Station, both of Tex., assignors to Del Norte Technology, Inc., Euless, Tex.

Filed Nov. 15, 1976, Ser. No. 741,855
Int. Cl.² E21B *7/06, 43/00*
U.S. Cl. 166—315 **19 Claims**

1. A wireline running tool comprising a pressurized pneumatic power source, a kickover means, and a module holding assembly, guide means on said tool for detecting an index mechanism adjacent said tool, means responsive to said guide

means for releasing the pressurized gas of said power source to operate said kickover means, and means responsive to operation of said kickover means for deflecting said module into a holding position.

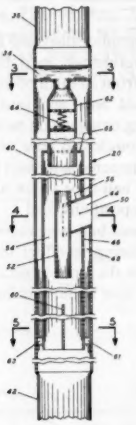


4,074,763

BOTTOM-HOLE GAS-LIQUID SEPARATOR

Robert A. Stevens, Calgary, Canada, assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 17, 1976, Ser. No. 751,790
Int. Cl.[2] E21B *43/02*
U.S. Cl. 166—325 **3 Claims**



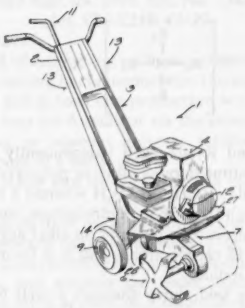
1. A bottom-hole gas-liquid separator comprising:
an elongated outer tubular member having an outer diameter suitable for running in a well to a position for producing fluids therefrom, plug means closing off the lower end of said outer tubular member;
an outlet for gas formed in the wall of said outer tubular member near the upper portion thereof;
coupling means on the upper end of said outer tubular member for connecting said outer tubular member to a production string for producing liquid from a well;
an outer inlet for fluid in the wall of said outer tubular member intermediate the ends thereof and substantially below said outlet for gas;
an intermediate tubular member smaller than said outer tubular member connected interiorly of said outer tubular member in concentric relationship therewith and extending at least three times it outer diameter above said inlet and six times its outer diameter below said inlet and forming an outer annular chamber with said outer tubular member;
an inner inlet for fluid in the wall of said intermediate tubular member below said outer inlet;
an inner tubular member arranged concentrically inside of said intermediate tubular member and forming an inner annular chamber therewith adjacent said outer inlet and said inner inlet, said inner tubular member extending from just above said inner inlet to no more than 20 diameters below said inner inlet;
conduit means connecting said outer inlet and said inner inlet and providing the only flow path for fluids from said outer inlet through said outer annular chamber into said intermediate tubular member through said inner inlet, said conduit means arranged to divert flow of fluids downwardly and tangentially into said inner annular chamber;
p1 a baffle plate connected in the lower end of said intermediate tubular member for stopping the vortex flow of fluids to prevent gas from being drawn down with the liquid
and gas conduit means spaced above and apart from the inner tubular member connecting the upper end of said intermediate tubular member to said cutlet for gas.

4,074,764

TILLER

Edward W. Enters, Fredonia, Wis., assignor to Gilson Brothers Company, Plymouth, Wis.

Filed Feb. 23, 1976, Ser. No. 660,128
Int. Cl.[2] A01B *33/02*
U.S. Cl. 172—42 **8 Claims**



4. A tiller comprising, in combination,
a frame having a vertically extending handle portion and, as a one-piece structure including said handle portion, a forked end including a generally horizontal leg and a generally vertical leg,
an engine including a flange located above said horizontal leg,
a gear box operatively connected to and driven by said engine, said gear box including a flange located above said horizontal leg,
a tine assembly operatively connected to and supported by said gear box and driven through said gear box,
connecting means comprising bolt means extending through and connecting said engine flange, said gear box flange, and said horizontal leg in mutual engagement, so that the load of said engine, gear box, and tine assembly is supported on said horizontal leg,
said forked end having a planar web portion arranged in a vertical plane,
said web portion and horizontal and vertical legs being in one-piece and said web portion forming the juncture

between said horizontal and vertical legs and also forming a vertical planar extension making up a portion of said horizontal leg,

and wheel means connected to said vertical leg.

8. A tiller comprising, in combination,

first and second frame sections each having, as a one-piece structure, a vertically extending handle portion and a forked end, said handle portion including a generally vertical planar portion,

said forked end including a generally horizontal leg, a generally vertical leg and a planar web portion forming the juncture between said horizontal and vertical legs and also forming a vertical planar extension of said horizontal and vertical legs,

said planar handle, vertical leg, horizontal leg and web portions being coplanar,

said frame sections being horizontally spaced relative to each other,

an engine,

a gear box operatively connected to said engine and driven thereby,

a tine assembly operatively connected to and supported by said gear box and driven through said gear box,

means connecting said engine and gear box to said horizontal legs and generally centered relative to said horizontal legs in a horizontal plane for supporting the load of said engine, gear box, and tine assembly on said horizontal legs, and wheels connected to said vertical legs.

4,074,765
SOIL CULTIVATING IMPLEMENTS

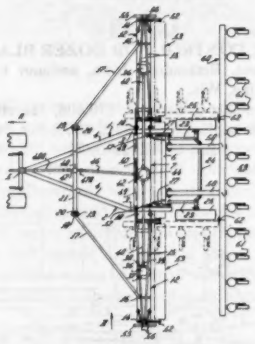
Cornelis van der Lely, 7 Bruschenrain, Zug, Switzerland

Filed May 20, 1976, Ser. No. 688,343

Claims priority, application Netherlands, May 23, 1975, 7506058

Int. Cl.[2] A01B *33/06, 33/16*

U.S. Cl. 172—59 **11 Claims**



8. A soil cultivating implement comprising a frame and a group or rotatable soil working members journalled in an elongated central portion of said frame, an elongated outer portion pivoted at each lateral side of said central portion and respective further groups of rotatable soil working members being journalled in the outer portions, said soil working members and further soil working members being rotatable about corresponding upwardly extending axes defined by respective shafts and said shafts being positioned in a row that extends transverse to the direction of travel, driving means engaging said soil working members and further members, two beams of said frame extending in the general direction of travel and said beams having rear portions that extend substantially parallel to one another and forward convergent portions that comprise coupling means, said rear portions being connected to the central frame portion and positioned above same, each outer portion being pivoted to the rear beam portions with spaced apart pivots, the axes of said pivots extending in the direction of travel and said outer portion being pivotable to an upward tilted transport position about said axes, respective supports connected to the outer frame portions intermediate the lengths thereof, each support extending forwardly to a pivot connection with the remainder of said frame and said connection having a pivot axis in line with said first mentioned pivot axis, said driving means comprising a gear box on said central portion and a corresponding transmission shaft that extends from said box, laterally to respective gear means of each further group of soil working members, said transmission shaft being displaceable upwardly with the corresponding outer portion in the latter's transport position.

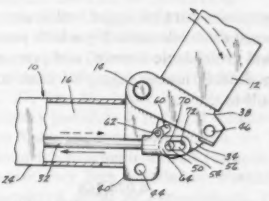
4,074,766
FLOATING FOLDING TOOL BAR HAVING A LOCK MEANS

Henry K. Orthman, Lexington, Nebr., assignor to Orthman Manufacturing Inc., Lexington, Nebr.

Filed May 24, 1976, Ser. No. 689,384

Int. Cl.[2] A01B *49/00*

U.S. Cl. 172—311 **4 Claims**



1. An agricultural implement comprising,

a tool bar including a main frame and at least one wing section, said wing section being pivotally movable between extended and angular positions,

a lost motion hinge pivotally interconnecting said wing section and said main frame whereby said wing section is free to pivot through a predetermined angle when in said extended position,

a hydraulic cylinder connected at one end to said main frame and pivotally connected at its opposite end to said wing section at a point remote from the pivotal axis of said hinge,

said wing section including an ear connected to said cylinder and having a slot opening towards said cylinder, and

a pin on said cylinder positioned to move into said slot when said wing section is moved substantially out of said extended position towards said angular position thereby limiting free pivotal movement of said wing section independently of said cylinder.

4,074,767
MOTOR GRADER SUPPORT STRUCTURE AND SIDE SHIFT MECHANISM

Carroll Richard Cole, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 14, 1976, Ser. No. 696,163

Int. Cl.[2] E02F *3/76*

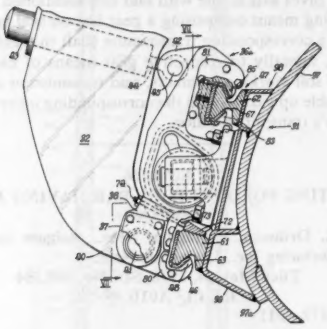
U.S. Cl. 172—781 **23 Claims**

1. In a motor grader which has a circle with a pair of integral, depending blade support arms at its rearward portion, an improved support means for mounting a grader blade assembly on said arms for endwise movement, said improved means comprising, in combination:

a unitary bearing housing structure comprising a transverse structural member which is entirely between the blade support arms and has a generally upright bearing housing integrally connected thereto at each of its ends between the support arms;

pivot means operatively associated with said housings inde-

pendently of and spaced from said structural member, said pivot means mounting said structure on said support arms and forward of the arms, said housings having open upper jaws and open lower jaws extending entirely across them;



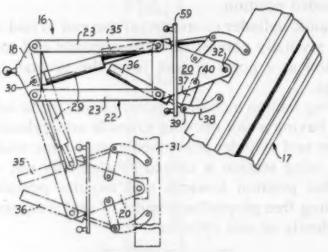
and substantially parallel upper and lower support rails on the rear of the blade assembly which extend through said jaws and are slidable therein, said jaws and support rails having slidably interengaging surfaces to retain the support rails in the jaws.

4,074,768

BLADE SUPPORT AND CONTROL ARRANGEMENT FOR A MOTOR GRADER

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 30, 1976, Ser. No. 719,003
Int. Cl.[2] E02F 3/76
U.S. Cl. 172—796 **17 Claims**



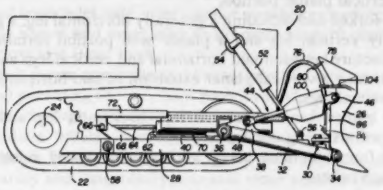
1. A construction vehicle comprising
a forwardly extending frame,
first bracket means universally connected to said frame,
second bracket means,
linkage means pivotally interconnected between said first and second bracket means for maintaining said first and second bracket means at least substantially parallel relative to each other upon movement of said second bracket means relative to said first bracket means,
first actuating means pivotally interconnected between said first and second bracket means for moving said second bracket means relative to said first bracket means,
a work tool assembly pivotally mounted on said second bracket means, and
a second actuating means pivotally interconnected between said second bracket means and said work tool assembly for pivoting said work tool assembly relative to said second bracket means.

4,074,769

BULLDOZER BLADE CONTROL

Claude M. Frisbee, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 28, 1976, Ser. No. 680,817
Int. Cl.[2] E02F 3/76
U.S. Cl. 172—804 **8 Claims**



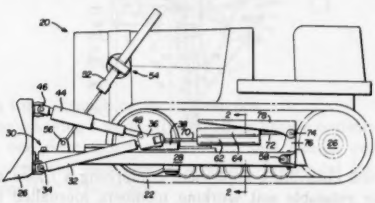
1. A vehicle having a U-shaped frame extending around the forward end of said vehicle, a transverse blade pivotally mounted adjacent its center on the forward end of said frame for angling movement about a vertical axis, a piston cylinder on opposed sides of said vehicle each having a rearwardly extending piston rod pivotally connected to said frame and a forwardly extensible cylinder spaced from said blade and each cylinder operably connected to said blade on opposed sides by a strut means, and a hydraulic control means having flexible lines extending from the lower front of said vehicle to the back of said blade adjacent the center of said blade in a downwardly opening flexible arch, said lines received in a channel-shaped shroud extending across the rear of said blade, said lines then extending in opposite directions along the back of said blade within said shroud and then back to said cylinders of said hydraulic piston-cylinders, said control means extending one cylinder while retracting the opposed cylinder to angle said blade about a vertical axis.

4,074,770

ANGLE CONTROL FOR DOZER BLADE

Claude M. Frisbee, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Continuation-in-part of Ser. No. 670,606, March 26, 1976, abandoned. This application June 2, 1977, Ser. No. 802,769
Int. Cl.[2] E02F 3/76
U.S. Cl. 172—804 **6 Claims**



1. In a vehicle having a U-shaped frame surrounding the forward end of said vehicle and a transverse scraper blade pivotally mounted on a vertical axis adjacent its midportion to the forward end of said frame, each side of said blade operably connected to said frame by a structural means permitting angling of said blade about said vertical axis, the improvement comprising: an angle control on each side of said vehicle, each of said angle controls comprising a pair of fluid operated piston-cylinders each having a pair of rigidly interconnected overlapping fluid cylinders and each cylinder having an extensible piston rod, said fluid cylinders vertically stacked above the side portions of said U-shaped frame with said piston rods extending in opposite directions, one piston rod of each pair extending rearwardly and operably connected to said frame and the opposed piston rod of each pair connected to said

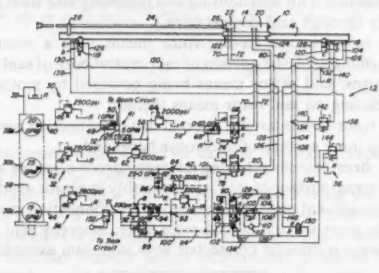
structural means by a universal connection, and a fluid control including a source of fluid under pressure, a flow line from said source to a valve, and a pair of branch lines from the valve to the cylinders on each side of said vehicle, one branch line being interconnected with the head end of both cylinders on one side of the vehicle and with the rod end of both cylinders on the opposed side of said vehicle, and the other branch line being interconnected with the rod end of both cylinders on said one side of said vehicle and with the head end of both cylinders on said opposed side of said vehicle, such that operation of said fluid control means extends both piston rods of one pair of piston-cylinders while simultaneously retracting the piston rods of the opposed pair of piston-cylinders with the vertically stacked fluid cylinders and piston rods extensible and retractable within the vertical projection of said frame side portions to angle said blade about said vertical axis and said frame protecting said fluid-cylinders.

4,074,771

ROCK DRILL

Ward D. Morrison, South Acworth, N.H., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Mar. 25, 1976, Ser. No. 670,262
Int. Cl.[2] B23Q *5/00*
U.S. Cl. 173—6 **19 Claims**



1. In a drilling apparatus adapted to drill earth formations and including a powered drill means and powered means for moving such drill means into biased engagement with such an earth formation; the improvement comprising: first motive means for simultaneously actuating such drill means and such means for moving; second motive means for selectively actuating such drill means to supplement said first mentioned actuating of such drill means; and control means cooperable with said second motive means to control said selective actuating in response to selected magnitudes of such biasing.

4,074,772

TORQUING TOOL CONTROL CIRCUIT

Gregg N. Jonsson, Batavia, Ill., assignor to Thor Power Tool Company, Aurora, Ill.

Filed Mar. 4, 1976, Ser. No. 663,678
Int. Cl.[2] B23Q *5/00*
U.S. Cl. 173—12 **19 Claims**

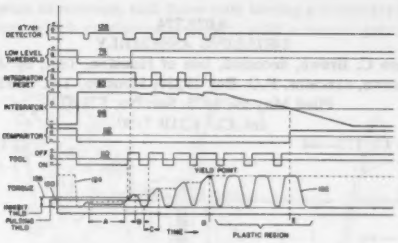
1. A control circuit for a torqueing tool, said tool including a torque measuring device, said circuit comprising:

a. a peak and hold circuit producing a signal representative of the highest value of measured torque,

b. means for operating said tool in a pulse mode in which the tool is turned on when the measured torque is below a selected threshold value and turned off when said torque is above said threshold value,

c. means for integrating from an initial output value to a final value at a selected rate,

d. means for detecting an increase in the peak and hold signal to reset said integrator means to said initial output value, and



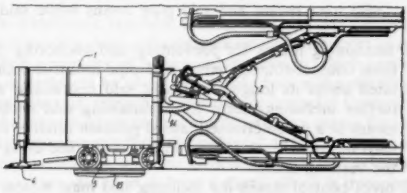
e. means comparing the output of said integrator means with a selectable comparator threshold for stopping said operating means.

4,074,773

HOLE DRILLING MACHINE

Vladimir Konstantinovich Grigoriev, 1 Streletsky pereulok, 3, kv. 24, Moscow; Viktor Dmitrievich Chugunov, Solnechnogorsky raion, stantsia Povarovo, poselok 2, dom 4, kv. 13, Moskovskaya oblast; Mikhail Nikolaevich Kudryakov, ulitsa Zholtovskogo, 27, kv. 10, Moscow; Alexandr Moiseevich Tsipkis, Ananievsky pereulok, 4/2, kv.121, Moscow; Vladimir Germogenovich Yakovlev, proezd Kirova, 6a, kv. 7, Moscow; Alexandr Samoilovich Averbukh, ulitsa Krasikova, 16, korpus 1, kv. 52, Moscow; Jury Ilich Scherbakov, Pushkinsky raion, stantsia Tarasovskaya, ulitsa B. Tarasovskaya, 39, Moskovskaya oblast; Natalia Dmitrievna Yakobson, Chernomorsky bulvar, 7, korpus 4, kv. 233, Moscow; Vyacheslav Fedorovich Semikozov, Vishnyakovskaya ulitsa, 6, korpus 5, kv. 29, both of Moscow; Viktor Vladimirovich Medvedev, prospekt Lenina, 23/40, kv. 110; Valery Vasilievich Yartsev, prospekt Lenina, 23/40, kv. 109, both of Nizhny Tagil; July Davydovich Kaganov, Yartsevskaya ulitsa, 28, korpus 1, kv. 66, Moscow; Vladimir Ivanovich Kuznetsov, ulitsa Kantemirovskaya, 5, korpus 2, kv. 320, Moscow, and Alexandr Iosifovich Sinelnikov, Oxkaya ulitsa, 36, korpus 2, kv. 47, Moscow, all of U.S.S.R.

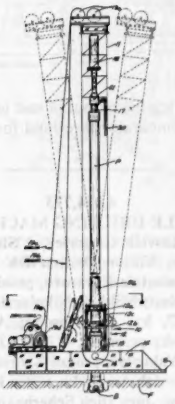
Filed June 7, 1976, Ser. No. 693,285
Int. Cl.[2] E21C *11/02*
U.S. Cl. 173—23 **7 Claims**



1. A machine for drilling holes at driving mine shafts of small to medium cross-sectional area, comprising: a gantry frame supporting the drilling tools thereon; a bogie accommodated within said gantry frame; a beam with projectable abutments upon which said gantry is adapted to bear in the transportation position of the drilling machine being mounted on said bogie along the longitudinal geometrical axis thereof for motion in a transverse direction with respect to the longitudinal geometric axis of said bogie; a mechanism for effecting the transverse motion of said beam; jacks mounted on said gantry frame, and bearing upon the ground in the drilling position and in the gantry position of the drilling machine; means for lifting the jacks off the ground in the transportation position of the drilling machine, said gantry frame being supported by said projectable abutments of said beam; a mechanism for lifting said

bogie, said mechanism being mounted on said bogie; and means for flexibly connecting said bogie to said gantry frame.

4,074,774
DRILLING ASSEMBLY
Cicero C. Brown, deceased, late of Houston, Tex., by Joe R. Brown, executor, P.O. Box 19236, Houston, Tex. 77024
Filed May 19, 1975, Ser. No. 578,677
Int. Cl.[2] E21B *7/00*
U.S. Cl. 173—44 **12 Claims**



1. A drilling assembly for forming an inclined borehole comprising:

a. drilling snubber means having a gripping head and a drilling head movable relative to each other for moving a pipe means gripped by one of said heads along the longitudinal axis of said pipe means, said snubber means including means for rotating said pipe means about its longitudinal axis;

b. mast means extending above said drilling snubber means;

c. anchoring means carried in said mast means for attachment to said pipe means including:

i. gripping means movable radially between a first configuration for gripping engagement with said pipe means and a second configuration for release of said pipe means; and

ii. swivel means for providing structural support between said mast means and said pipe means while said pipe means is rotated;

d. restraining means for preventing said anchoring means from counter-rotating when said pipe means is being rotated about its longitudinal axis, said restraining means further including means for maintaining said anchoring means at a predetermined lateral position relative to said mast means when said mast means is inclined away from the vertical; and

e. pivot control means for inclining said mast means, gripping heads and pipe means to form inclined bore holes.

4,074,775
POWER SWIVEL
William T. Lee, Harvey, La., assignor to Fishing Tools, Inc.
Continuation of Ser. No. 552,810, Feb. 25, 1975, abandoned. This application May 20, 1976, Ser. No. 688,464
Int. Cl.[2] E21B *3/06*
U.S. Cl. 173—79 **5 Claims**

1. A power swivel assembly, comprising:

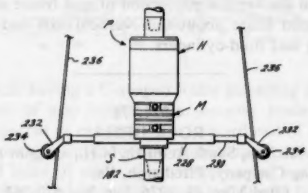
a housing have a non-rotating axial housing passageway therein for receiving working fluid under pressure and passing working fluid through at least a portion of said housing;

a stem assembly mounted for rotational movement with respect to said housing and having a stem assembly bore therethrough in fluid communication with said housing passageway for receiving working fluid under pressure from said housing passagewy and passing working fluid through said stem assembly;

an internal washpipe extending from a portion of said housing passageway into a portion of said stem assembly bore permitting sealable fluid communication of working fluid between said non-rotating housing passageway and said rotating stem assembly bore;

first seal means between said washpipe and said housing;

second seal means between said washpipe and said stem assembly;



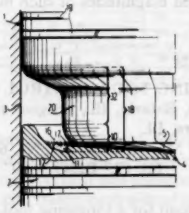
hollow bore motor means having a central bore and mounted with said housing and receiving said stem assembly through said central bore;

said motor means having rotor means with a rotor bore forming at least a portion of said central bore of said motor means, said motor means being powered by motor fluid reacting on said rotor means thereof;

said rotor means having internal drive connection means on the inner surface of said rotor bore; and

said stem assembly having external driving means on the external surface of said stem assembly in rotational driving engagement with said internal drive connection means on the inner surface of said rotor bore, whereby said motor means is directly connected with said stem assembly.

4,074,776
DIESEL PILE-DRIVING RAM
Hans Günther Schnell, Hamburg, Germany, assignor to Van Kooten B.V., Naarden, Netherlands
Filed Dec. 5, 1975, Ser. No. 637,985
Claims priority, application Netherlands, Dec. 10, 1974, 7416086
Int. Cl.[2] E02D *7/12*
U.S. Cl. 173—137 **3 Claims**



1. A diesel pile-driving ram comprising at least one combustion cylinder, a striker extending into the combustion cylinder, a piston housed in the combustion cylinder said striker and piston having generally complementary impact surfaces which mate with one another; and a fuel injector for supplying fuel between the impact surfaces of the piston and the striker, said striker and piston having peripheral surface portions adjacent their respective impact surfaces and being spaced from said cylinder to define a compression space in the cylinder when the striking surfaces of the piston and the striker are engaged,

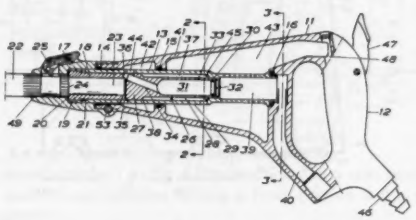
said compression space including at least one annular main combustion chamber and at least one annular precombustion chamber communicating with the former, said precombustion chamber being generally smaller than said main combustion chamber and located immediately adjacent the impact surfaces of the striker and piston to receive fuel sprayed from said impact surfaces upon impact of the striker and piston, said precombustion chamber communicating with the main combustion chamber through an annular passage of short length in an axial direction.

4,074,777

PNEUMATIC IMPACT TOOL

Sture Roland Andersson, Saltsjo-Duvnas, and Heino Elmessaar, Lidingo, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 601,160, Aug. 1, 1975, abandoned. This application Mar. 11, 1977, Ser. No. 776,741
Claims priority, application Sweden, Aug. 8, 1974, 7410147
Int. Cl.[2] B25D *9/06*
U.S. Cl. 173—138 **12 Claims**



1. Pneumatic impact tool for driving a working implement having a shank portion, comprising:

a cylinder having a front opening for receiving the shank portion of a working implement such that said working implement is movable axially relative to said cylinder;

a differential hammer piston reciprocably powered in said cylinder, said hammer piston having a large piston area facing the impact direction; and

a small piston area facing the reverse direction;

said hammer cylinder comprising a rear, continuously pressurized drive chamber for imparting a substantially uniform forward directed driving force on said small, reverse direction facing piston area; and a forward, intermittently pressurized drive chamber for imparting a periodically acting, backward directed driving force on said large, impact direction facing piston area; and

said cylinder including means for retaining said working implement so that said working implement receives the entire reaction force resulting from said periodically acting, backward directed driving force imparted by said forward drive chamber of said cylinder, whereby said cylinder is prevented from being influenced by said periodically acting force.

4,074,778

SQUARE HOLE DRILL

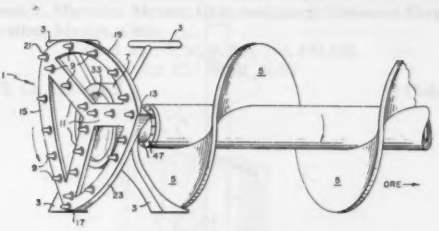
Roger J. Morrell, Bloomington; Jerome A. Gunn, St. Paul, and Gerald D. Gore, White Bear Lake, all of Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed July 14, 1976, Ser. No. 705,361
Int. Cl.[2] E21C *13/04, 1/14;* **E02D** *17/14*
U.S. Cl. 175—91 **9 Claims**

1. A square hole drill system comprising:

(a) a rotatable cutterhead having drill cutting surfaces about at least part of its periphery and facing towards the surface to be cut, said periphery being configured so that its outer most cutting surfaces would outline the apexes of a Reuleaux triangle;

(b) a gear drive operatively connected to said cutterhead to cause its rotation, said drive train having a stationary first gear which continuously meshes with a second gear that



rotates around said first gear in a direction opposite to said cutterhead rotation, said second gear being rotated by an output shaft at one side attached to move in unison with said cutterhead; and

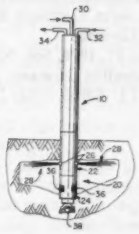
(c) an eccentric drive connected to the other side of said second gear to cause it to move around the first gear.

4,074,779

BACKWASHING SYSTEM FOR SLURRY PICK-UP USED IN HYDRAULIC BOREHOLE MINING DEVICES

John B. Cheung, and Earll M. Murman, both of Kent, Wash., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 9, 1977, Ser. No. 794,898
Int. Cl.[2] E21B *39/00, 21/00*
U.S. Cl. 175—314 **6 Claims**



1. In a hydraulic borehole mining device having oppositely directed cutting jets, a slurry pick-up and transport system including a plurality of particle inlets through which particles of the material cut by said jets are picked up, a like plurality of screens covering respective ones of said inlets for limiting the size of the particles picked up, slurry jet pump means for serving in pumping input fluid through said device such that said particles are drawn into the device through said inlets and entrained into said fluid to form a slurry which is transported out of said device, and including a valve means, located upstream of said inlets, for, in a first, open position thereof, permitting transporting of said slurry out of said device and for, in a second, closed position thereof, blocking the flow of said slurry and causing said inlet fluid to reverse the flow thereof out through said screens to provide cleaning of said screens.

4,074,780

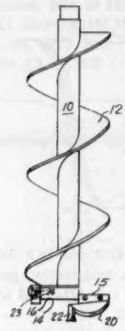
EARTH AUGER

Robert E. Gilbert, 166 High St., Buffalo, Wyo. 82834

Filed July 28, 1976, Ser. No. 709,293
Int. Cl.[2] E21C *1/14;* **E02D** *7/14;* **E21B** *9/06*
U.S. Cl. 175—392 **3 Claims**

1. An earth auger comprising a shaft, a continuous flight element extending upwardly along and coaxial with said shaft,

said flight element terminating at its lower extremity in a stabilizing plate whose upper portion has a flange which supports undercutting tooth element at the outer extend of said flange remote from said shaft, said stabilizing plate terminating at a position diametrically opposed from and lower than said tooth



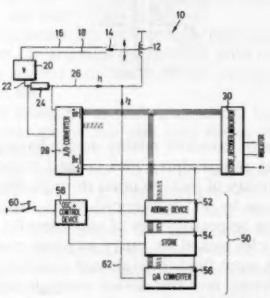
element having means thereon for fastening a stabilizer pilot drill means, said last named means comprising a continuous curved blade element of radial extent and a pilot drill disposed on the inner portion of said blade axially aligned with said shaft but remote therefrom to provide a space between said pilot drill and said shaft.

4,074,781

ELECTROMAGNETICALLY COMPENSATING WEIGHING OR DYNAMOMETER APPARATUS

Franz Josef Melcher, Ellierode, Germany, assignor to Sartorius-Werke GmbH (und. vorm. Gottinger Praezisionswagenfabrik GmbH), Gottingen, Germany

Filed June 17, 1976, Ser. No. 697,260
Claims priority, application Germany, June 24, 1975, 2528141
Int. Cl.[2] G01G *7/02, 23/16*
U.S. Cl. 177—212 **9 Claims**



1. An electromagnetically compensating weighing or dynamometer apparatus comprising: a coil provided in a working gap of a magnet, said coil being operatively associated with a movable part of the apparatus and being deflected under action of a force out of a preadjusted position of equilibrium in relation to said magnet;

a compensation circuit which includes a position indicator coupled to said coil, a power amplifier responsive to position of said indicator, and said coil and which, when a deflection occurs, allows a compensation current proportional to the amplitude of the deflection to flow through said coil;

an analog-digital (A/D) converter coupled to said compensating circuit and responsive to an output therefrom and having its output coupled to a digitally operating measurement indicator; and

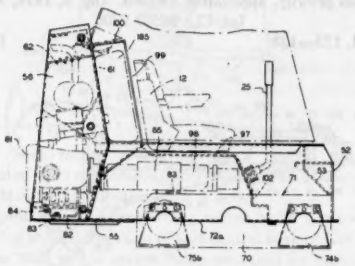
a taring arrangement which includes, connected in series, a store and a digital-analog (D/A) converter, an input of said store being coupled to an output of said A/D converter which is coupled with said measurement indicator, and an output of said D/A converter being connected to said coil, forming a taring circuit having its output coupled in parallel to that portion of said compensation circuit exclusive of said compensation coil.

4,074,782

HYDRAULIC SYSTEM OF A SKID STEER LOADER

James J. Bauer, Lisbon, N. Dak., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Feb. 2, 1976, Ser. No. 654,259
Int. Cl.[2] B62D *11/04*
U.S. Cl. 180—6.48 **1 Claim**



1. In a skid steer vehicle, vehicle drive means comprising an engine mounted in the rear of the vehicle, a variable displacement pump driven by said engine, said variable displacement pump being characterized by a series of revolving pistons and cylinders, said pistons being displaced by an inclinable swash plate, a hydraulic pump for driving implements associated with the vehicle juxtapositioned forward of the variable displacement pump and axially aligned therewith, said drive means including an output shaft associated with the variable displacement pump and an output shaft associated with the implement pump, the respective shafts axially aligned, and internal connecting means between the variable displacement pump and the hydraulic implement pump comprising a passage between the respective pumps concentric with the axial shafts of the pumps, the passage providing an internal means for the flow of excess hydraulic fluid from the variable displacement pump to the implement pump, to supply the implement pump with inlet fluid.

4,074,783

WATER DRIVE SYSTEM FOR A CENTER PIVOT IRRIGATION UNIT OR THE LIKE

Kenneth E. Arndt, Columbus; Lonnie E. Otto, Jr., Lindsay, and David A. Siekmeier, Columbus, all of Nebr., assignors to Lindsay Manufacturing Company, Lindsay, Nebr.

Filed July 19, 1976, Ser. No. 706,475
Int. Cl.[2] B05B *3/12*
U.S. Cl. 180—14 R **9 Claims**

1. In a water drive system for an overhead mobile (a center pivot) irrigation unit, a string of pipe extending over the field to be irrigated (outwardly from a center pivot) and supported at intervals by wheeled towers, a drive on each one of the

towers responsive to the pressure of the water in the pipe including a flexible bellows on the tower constructed to expand and contract in a defined direction, a water line between the string of pipe and the bellows to supply water thereto, a valve in the line at each tower for independently controlling the water supply, a control for operating the valve so that the water will be cyclically supplied to and exhausted from the bellows, and a linkage responsive to expansion and contraction of the bellows for rotating at least one wheel of the tower.

4,074,784

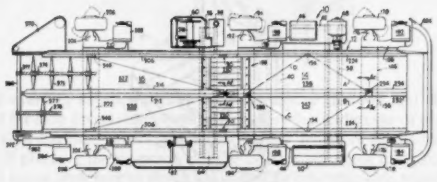
ARTICULATED HAULAGE VEHICLE

Arthur L. Lee, and Arthur B. Coval, both of Columbus, Ohio, assignors to FMC Corporation, Chicago, Ill.

Division of Ser. No. 347,646, April 4, 1973. This application Aug. 14, 1974, Ser. No. 497,294

Int. Cl.[2] B62D *61/10*

U.S. Cl. 180—24 **9 Claims**



1. An articulated haulage vehicle comprising,

a frame member having a front section and a rear section, each of said sections having a front portion and a rear portion,

means connecting said frame member front section to said frame member rear section to permit articulation therebetween,

a pair of driven and steerable rear wheels mounted on opposite sides of said frame member rear section adjacent the rear portion of said frame member rear section,

a pair of intermediate wheels mounted on opposite sides of said frame member rear section adjacent the front portion of said rear section,

a pair of driven and steerable front wheels mounted on opposite sides of said frame member front section adjacent the front end portion of said frame member front section,

a body member having a longitudinally extending haulage compartment therein, said body member mounted on said frame member rear section,

said body member having a floor portion with a pair of side walls extending upwardly therefrom,

a boom member having a longitudinal haulage compartment therein, said boom member mounted on said frame member front section,

said boom member having a floor portion with a pair of spaced side walls extending upwardly therefrom,

said boom member floor portions include a rear edge portion,

a transverse support member secured to said frame member rear section adjacent the front portion of said frame member rear section,

a boom member connecting means extending upwardly from said transverse support member,

said boom member having a connecting member extending rearwardly therefrom, said connecting member positioned in overlying relation with said upwardly extending boom member connecting means,

flexible means connecting said boom member to said body member to permit articulation therebetween and forming an elongated longitudinal haulage compartment, and

endless conveyor means extending along the surfaces of said boom member floor portion and said body member floor portion, said endless conveyor means arranged to convey material in said elongated longitudinal haulage compartment.

4,074,785

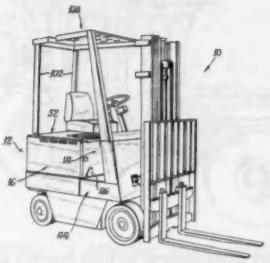
BATTERY ENCLOSURE

Frank V. Masevice, Mentor, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Apr. 5, 1976, Ser. No. 673,505

Int. Cl.[2] B60R *18/02*

U.S. Cl. 180—68.5 **9 Claims**



1. An enclosure for a battery of a vehicle or the like comprising:

a plurality of side panels;

a top panel supportable by the side panels and on which a load may be placed;

means for selectively limiting lifting of an edge portion of the so-supported top panel relative to one of the side panels comprising a pivotal member secured to said one of the side panels and pivotable to a first position wherein a portion of the pivotal member and a portion of said side panel are disposed on either side of the edge portion of the so-supported top panel in close proximity thereto, whereby said edge portion of the top panel is limited from lifting relative to said side panel, and pivotable to a second position removed from said so-supported top panel to allow lifting of said edge portion of the so-supported top panel from said side panel; and

means for selectively securing the pivotal member in said first position thereof; wherein the means for selectively securing the pivotal member in said first position thereof comprise a projecting member secured to said one side panel and projecting through an aperture provided in the pivotal member with the pivotal member in said first position, and means for selectively securing the pivotal member relative to the projecting member of the pivotal member in said first position; and

wherein the means for selectively securing the pivotal member relative to the projecting member comprise a slide member slidably mounted on the pivotal member and slidable to seat in a recess in the projecting member with the projecting member disposed through the aperture provided in the pivotal member to secure the pivotal member in the first position thereof, and slidable to be removed from said recess to allow pivoting of the pivotal member to the second position thereof.

4,074,786

SELF LOCKING COMPARTMENT FOR TRACTOR

Jerauld D. Joubert, Argusville, N. Dak., assignor to Steiger Tractor Inc., Fargo, N. Dak.

Filed Aug. 10, 1976, Ser. No. 713,105

Int. Cl.[2] B60R *18/02, 3/00*

U.S. Cl. 180—68.5 **11 Claims**

1. A tractor having a tractor frame,

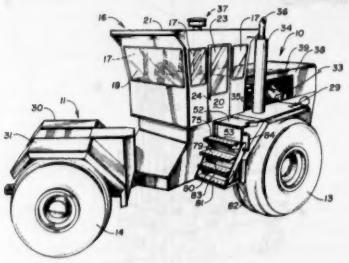
a driver's cab and an engine supported on said frame,

said driver's cab having an access door movable between open and closed positions,

a plurality of wheels supporting said frame, at least some of which are connected to said engine in driven relation thereto,

one of said wheels being located beneath and adjacent said access door,

a plurality of fenders each extending at least partially over one of said wheels including said one wheel beneath said access door and having an upper portion spaced from the wheel over which it extends,



an accessory compartment secured beneath said upper portion of said fender in the space over said wheel,

and said upper portion of said fender including a cover part overlying said compartment and hinged to a fixed part of said fender for upward swinging movement to enable access to said compartment,

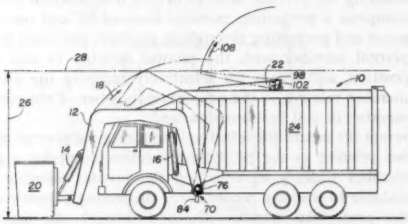
said cover part extending beneath the lower edge of said cab access door when said door is closed so that said cover part can not be swung upwardly to open position while said door is closed.

4,074,787

SAFETY DEVICE FOR A FORK-LIFT EQUIPPED REFUSE VEHICLE

Richard I. Cunningham, Pittsburgh, and Daniel E. Day, Watsontown, both of Pa., assignors to Lenmar Industries, Inc., Pittsburgh, Pa.

Filed July 7, 1976, Ser. No. 703,214
Int. Cl.[2] B60T 7/12
U.S. Cl. 180—82 B **4 Claims**



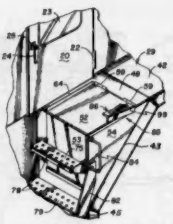
1. A safety device for a vehicle having a fork lift movable on a rotatable shaft to an elevated operative position; and a braking system including a pressure fluid chamber, a parking brake applying member within said chamber, a spring urging said member in a brake applying direction, and means for maintaining a pressure within said chamber for maintaining said member in a brake released condition, said safety device comprising a fork lift position-indicating projection mounted on said rotatable shaft of said fork lift so as to be operatively arranged to have a path of pivotal transversing movement incident to movement of said fork lift into said elevated operative position thereof, an elongated conduit in communication at one end with the aforesaid pressure fluid chamber and operatively arranged to have its opposite end located adjacent said path of pivotal traversing movement of said position-indicating projection, and a normally closed valve disposed in sealing relation in said opposite conduit end and located in said path of said pivotal traverse movement so as to be urged from its normally closed condition into an open condition upon being contacted by said position-indicating projection, whereby said vehicle parking brakes are automatically applied whenever said vehicle fork lift assumes said elevated operative position to thereby prevent vehicle movement with said fork lift in said operative position.

4,074,788

TRACTOR DOOR LATCH

Jerauld D. Joubert, Argusville, N. Dak., assignor to Steiger Tractor Inc., Fargo, N. Dak.

Filed Aug. 9, 1976, Ser. No. 712,856
Int. Cl.[2] E05C 3/04
U.S. Cl. 180—89.12 **9 Claims**



1. In combination:

a tractor having a tractor frame, a driver's cab and an engine supported on said frame, said driver's cab having an access door movable between open and closed positions, a plurality of wheels supporting said frame, at least some of which are connected to said engine in driven relation thereto, one of said wheels being located beneath and adjacent said access door, a plurality of fenders each extending at least partially over one of said wheels including one fender extending over said one wheel beneath said access door, said fender having a width substantially as great as the width of the access door, and a yieldable latch for said door, said latch comprising;

a latching member pivotally mounted on said one fender adjacent the outer edge thereof and having an upper surface, and

means yieldably biasing said latching member upwardly so as to cause said upper surface to move against the under side of said door when said door is opened by at least a predetermined amount, the upper surface of said latching member movable into engagement with the under side of said door having an intermediate latching portion coacting with said door to maintain the same in a substantially open position and a further portion movable downwardly against said biasing means to a position in which said door can be moved to a further open position to permit free access to the portion of the fender on which said latching member is located.

4,074,789

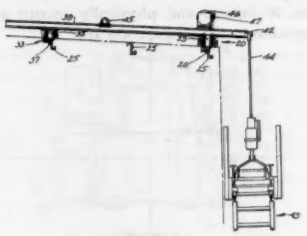
MOBILE ROLLING SUPPORT SYSTEM FOR SCAFFOLDING USED IN BUILDING CONSTRUCTION

Daniel E. Warren, Centerville, and Donald M. Taylor, Hamilton, both of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed Feb. 13, 1976, Ser. No. 657,980
Int. Cl.[2] E04G 3/10, 3/14
U.S. Cl. 182—37 **17 Claims**

1. A mobile rolling support system for scaffolding used in building construction prior to installation of roof panels, including a rolling support comprising: frame structure rigidly

connecting two outriggers together, one being the leading outrigger and the other being a trailing outrigger, each outrigger having at least one near-side traveling wheel to ride on an exposed structural roof member adjacent the side (or end) of a building and at least one far-side force roller extending beneath a parallel exposed structural roof member removed from said building side (or end), said outriggers being parallel to one another and adapted to extend across and ride on said parallel exposed structural roof members; said near-side traveling wheels bearing down on their exposed structural roof member



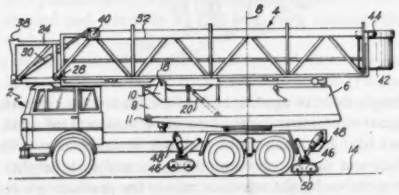
and exerting substantial downward pressure thereon and the said far-side force rollers bearing against the underside of said parallel exposed structural roof member to exert substantial uplift pressure thereagainst; remote controlled motor means on said frame structure to drive a said at least one near-side traveling wheel; and support means extending from said rolling support and to which support means scaffold structure may be attached; whereby said motor means may be actuated from time to time to move said rolling support along said exposed structural roof members so that the scaffolding structure is moved along the side (or end) of said building.

4,074,790

VEHICLE-BORNE INSPECTION AND MAINTENANCE APPARATUS

Daciano Colbachini, and Romeo Chiarotto, both of piazza Costello nr. 16, Padua, Italy

Filed Sept. 13, 1976, Ser. No. 722,608
Claims priority, application Italy, Feb. 27, 1976, 41536/76
Int. Cl.[2] E04G *1/36, 3/10*
U.S. Cl. 182—63 **5 Claims**



1. A vehicle-borne inspection and maintenance apparatus comprising

a vehicle having a turret rotatable thereon about a generally vertical axis;

a first elongated frame member pivotally mounted at one edge of said turret for pivotal movement in a vertical plane from a horizontal position over said turret to a vertical position outwardly of one end of said turret;

a second frame member slidably movable longitudinally of said first frame member when in said vertical position;

a third frame member pivotally carried by said second frame member, at the lower end thereof, for pivotal movement about the longitudinal axis of said first member; and

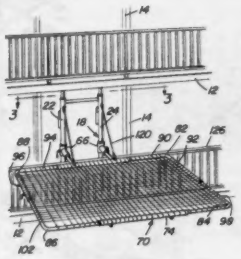
an elongated scaffold member extending laterally from said third frame member at the lower end thereof and below the level of said vehicle.

4,074,791

EMERGENCY FIRE NET

Johnny K. Inman, 1205 Clearview Drive, Atlanta, Ga. 30319

Filed Mar. 16, 1976, Ser. No. 667,377
Int. Cl.[2] A62B *1/22*
U.S. Cl. 182—138 **6 Claims**

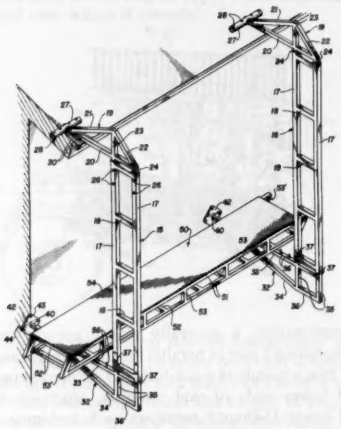


1. In combination, a generally planar upright mounting structure including a pair of parallel tubular uprights and upper and lower brace members extending and secured between the upper and lower ends of said uprights, relatively inverted upper and lower U-shaped members each including parallel legs and a bight portion extending between and connecting one pair of corresponding ends of the legs thereof, said U-shaped members having their legs telescopingly engaged within the upper and lower ends of said uprights, positioning means interconnected between said U-shaped members and said tubular members for adjustably extending the former relative to the latter, a pair of collars mounted on said uprights between said brace members for adjustable positioning along said uprights and including means operative to releasably lock said collars in adjusted positions along said uprights between said upper and lower brace members, a generally horizontal support frame pivotally supported from said collars and projecting outwardly from one side of said mounting structure with said frame swingable relative to said mounting structure about an axis paralleling a path extending between said collars between a first operative horizontal position disposed generally normal to said mounting structure and an inoperative vertical position closely adjacent and generally paralleling said mounting structure, said frame being generally rectangular in configuration and longitudinally and transversely extendable and retractable in directions extending along and transverse to said axis, respectively, a flexible catch structure secured across said frame, means operative to releasably secure said frame in said operative position, brace structure connected between said mounting structure and an outer portion of said frame releasably bracing said frame in said operative position against downward swinging of the outer portion of said frame relative to said mounting structure, one of said uprights including upper and lower leg members supported from the upper and lower ends thereof and projecting horizontally outwardly from the side of said one upright remote from the other upright, the outer ends of said leg members including supporting wheel means journaled therefrom, said frame, when extended longitudinally, projecting outwardly beyond the free ends of said leg members and, when longtiudinally retracted, terminating inwardly of the free ends of said legs, said collars being shiftable along said tubular uprights to positions closely adjacent the lower ends thereof, whereby when said U-shaped members are retracted relative to said uprights and said frame is swung to said inoperative position, said mounting structure may be positioned with said wheel means lowermost and rolled over a horizontal support surface with said frame and mounting structure disposed in closely superposed registry with each other.

4,074,792
PORTABLE HANGING SCAFFOLD

Alonzo N. Zaugg, Rte. 2, Box 226, Rigby, Idaho 83442, and Richard W. Ellis, Box 13, Ririe, Idaho 83443

Filed May 11, 1977, Ser. No. 795,938
Int. Cl.[2] E04G 3/10
U.S. Cl. 182—150 12 Claims

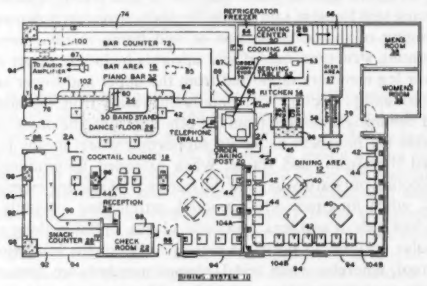


1. A hanging scaffold comprising a pair of end vertical frames each having a pair of vertical open ended tubular members, upper and lower pairs of horizontal support arms each having pairs of spaced vertical extension bars adapted for adjustable telescopic engagement within said tubular members, means to releasably lock the extension bars in selected adjusted positions within the tubular members to establish the overall vertical height of the scaffold, the upper pair of horizontal support arms being engageable with a building structure to suspend the scaffold thereon and lower pair of support arms adapted to engage a wall of a building structure, a walkway formed as a separate unit and adapted to rest bodily on said lower pair of support arms, and selectively engageable plural interlocking means on the walkway and pair of lower support arms enabling the walkway to be adjusted longitudinally and laterally on the pair of lower support arms.

4,074,793
RESTAURANT DINING SYSTEM

Seymour C. Yuter, 407 Cedar Drive West, Briarcliff Manor, N.Y. 10510

Filed July 9, 1976, Ser. No. 703,952
Int. Cl.[2] E04H 3/04
U.S. Cl. 186—1 R 35 Claims

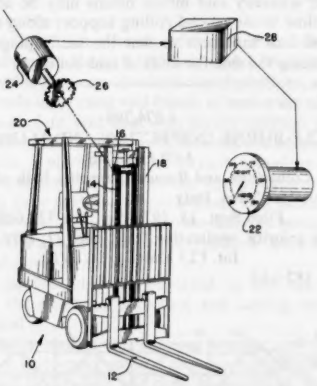


32. A food or drink service system comprising:
(a) a table area having a plurality of separate tables;
(b) a preparation area for preparing food or drinks;
(c) an order-taking post physically separate from said preparation area and in two way visual communication with tables in said table area; and
(d) an electrical audio signal communication system for taking oral orders from people at tables in said table area comprising (1) a plurality of audio transmitter-receivers each positioned near a person at one of said tables in said table area and (2) an audio transmitterreceiver at said order-taking post;
(e) whereby a person at said order-taking post can both see and communicate by electrical audio signal transmission with a person at a table, who can see the order-taking person, to initiate and physically record an order for transmission to the preparation area.

4,074,794
HEIGHT INDICATOR AND CONTROL FOR FORK LIFT TRUCKS

Rolland D. Scholl, Peoria, Ill., assignor to Towmotor Corporation, Mentor, Ohio

Filed Oct. 31, 1975, Ser. No. 627,828
Int. Cl.[2] G05D 3/08
U.S. Cl. 187—29 A 4 Claims



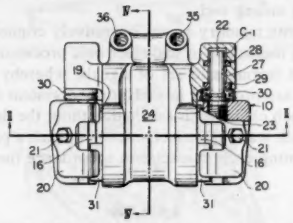
1. Height control apparatus for fork lift trucks, comprising:
a. signal-generating means operatively associated with the fork lifting mechanism of said fork lift truck to provide an electrical signal representative of actual fork height;
b. presettable height selection means for producing a height selection signal;
c. comparator means connected to said signal-generating means and said height selection means for comparing said actual fork height signal and said height selection signal;
d. fork control means on said fork lift truck for raising and lowering said forks, said fork control means being normally biased into a fork stopping position but being releasably holdable in raising or lowering positions by locking means;
e. electromagnetic means associated with said fork control means for releasing said locking means; and,
f. means connecting said comparator means and said electromagnetic means for actuating said electromagnetic means to release said locking means when the actual height of said forks correspond to the height selected by said height selection means.

4,074,795

CALIPER MOUNTING ARRANGEMENT FOR A DISC BRAKE

Toshio Kondo, Chiryu; Masakazu Ishikawa, Toyota; Masayoshi Katagiri, Toyota, and Jiro Kizaki, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Sept. 18, 1975, Ser. No. 614,629
Claims priority, application Japan, Oct. 1, 1974, 49-113630
Int. Cl.[2] F16D 65/02
U.S. Cl. 188—73.3 4 Claims



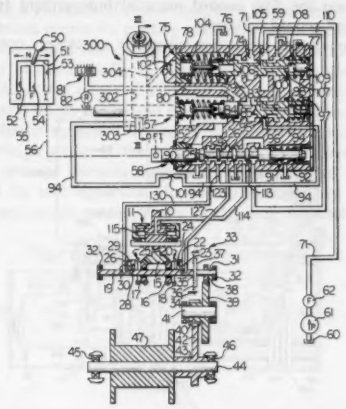
1. A disc brake comprising;
a friction disc secured to a rotational portion of a vehicle wheel assembly to rotate therewith,
a stationary member secured to a fixed portion of the vehicle wheel assembly,
a movable member movably mounted on said stationary member for movement in the direction of the rotational axis of said friction disc,
fluidly operated brake actuating means mounted within said movable member,
a first brake pad assembly slidingly fitted on said stationary member for shifting in the direction of the rotational axis of said friction disc to be applied to one face of said friction disc by said brake actuating means during the braking operation whereby torque is transmitted from said first pad directly to said stationary member,
a second brake pad assembly carried by said movable member to be brought into contact with the opposite face of said friction disc under reaction force derived from said first pad assembly whereby torque is transmitted from said second pad assembly to said stationary member through said movable member,
a pair of parallel pins extending from said stationary member in the direction of the rotational axis of said friction disc,
a pair of bores provided in said movable member diametrically larger than said pins to receive said pins in spaced relationship between the internal face of said bores and the face of said pins,
at least one elastic ring surrounding each pin so as to fill the annular space formed between said pins and said bores,
a first guiding means provided on said movable member, and
a second guiding means including a pair of lugs radially extending from said stationary member, a pair of arms extending from said lugs parallel with the rotational axis of said disc, and a pair of parallel guide rails provided on said arms for cooperation with said first guiding means, said first guiding means and said guide rails on said arms being spaced apart by the resilient force of said elastic rings when said disc brake is in a non-braking condition and said first guiding means being in sliding contact with one of said guide rails when said disc brake is in a braking condition by deformation of said elastic rings whereby the torque from said second brake pad is transmitted to said one guide rail and said pins of said stationary member through said movable member.

4,074,796

ADJUSTABLE SEQUENCE VALVE FOR TOWING WINCH HYDRAULIC CONTROLS

Richard F. Hoehn, Pekin; Hugh C. Morris, Morton; Henry T. Therkildsen, and Bertwin E. Behrends, both of East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 2, 1976, Ser. No. 654,484
Int. Cl.[2] F16D 67/02
U.S. Cl. 192—3.57 4 Claims



1. A control for a winch system, said winch system having a cable drum, drive means for rotating said drum, a winch input means, means including first and second fluid pressure actuated clutch means for coupling said winch input means to said drive means to rotate said drum in one direction when said first clutch means is actuated and to rotate said drum in the opposite direction when the second clutch means is actuated, power input means and a third fluid pressure actuated clutch means for coupling said power input means to said winch input means when said third clutch means is actuated, said control comprising:
a. a source of fluid under pressure;
b. means for adjustably reducing the pressure of fluid from said source and for applying the reduced pressure fluid to said first and second clutch means;
c. means including a normally closed valve for applying pressure fluid from said source to said third clutch means when said valve is open; and
d. means responsive to the pressure level of said reduced pressure fluid including a manually positionable member having first and second positions for opening said valve when said manually positionable member is in its first position and said pressure level exceeds a predetermined low level and for opening said valve when said manually positionable member is in its second position and said pressure level exceeds a predetermined high level.

4,074,797

SINGLE STATION, PLURAL FUNCTION PRINTER

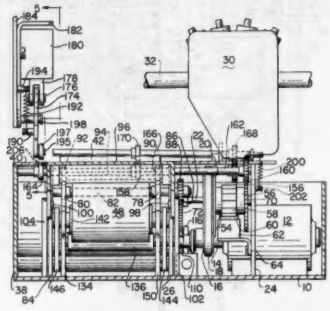
Kim R. Lewis, Lansing, and William H. Corbett, Ithaca, both of N.Y., assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 638,796, Dec. 8, 1975, abandoned. This application Feb. 7, 1977, Ser. No. 766,292
Int. Cl.[2] B41J 15/22
U.S. Cl. 197—1 R 4 Claims

1. Mechanism for driving a plurality of record materials across a stationary platen and past a single printing station for printing on different combinations of record materials, comprising
drive means,
driven means including a clutch assembly connected with said drive means for intermittent operation,

first drive roller means including a first shaft and connected with said clutch assembly and operable to advance first record material past said printing station in one direction, second drive roller means including a second shaft parallel with said first shaft and connectable with said driven means and operable to advance second record material past said printing station in said one direction, the first record material being wider than the second record material and the first drive roller means having rollers spaced wider than the width of the second record material for driving the first record material independent from the second record material,

electromagnetic actuating means for selectively connecting



said second drive roller means with said driven means for driving said second drive roller means with said first drive roller means to advance the respective first and second record materials in said one direction,

third drive roller means operable to advance third record material past said printing station in a direction opposite said one direction, said third drive roller means including a third shaft having one end thereof connected with said driven means, and

electromagnetic actuating means for swingably moving the other end of said third shaft from an inclined attitude to a position parallel with and spaced from said first shaft to engage said third drive roller means with said third record material.

4,074,798

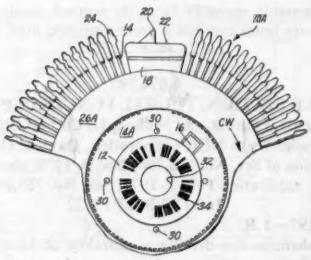
ENCODED PRINT WHEEL SYSTEM

Michael A. Berger, Richardson, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 1, 1976, Ser. No. 719,630

Int. Cl.[2] B41J *1/30*

U.S. Cl. 197—53 **21 Claims**



1. An electronic printing system having a serial impact printer, an electronic processor, and means for inputting data to be printed, comprising:

a print element connected to said impact printer and having a plurality of characters arrayed thereon, said element having a read only memory containing coded information associated with selected parameters of said characters, said read only memory containing an index position designating a start characters, said read only memory containing an index position designating a start of message;

means for reading the coded information contained in said memory and for converting said coded information into a set of signals;

means for providing at least one complete revolution of the print element with respect to the index position prior to inputting data to the printer for subsequent printing, whereby said coded information is read by said code reading means; and

a read/write memory means operatively connected to said reading means and to said electronic processor for receiving and storing said set of signals, whereby said stored signals are provided in said printing system immediately after each character is selected without the delays associated with waiting for a character to reach a print position for printing each character in accordance therewith.

4,074,799

RIBBON CARTRIDGE HAVING SLACK PREVENTING MEANS

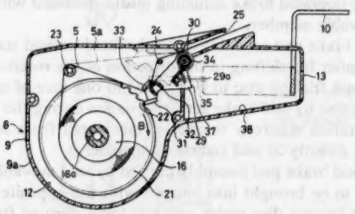
Yukio Hishida, Nagoya; Tomoyoshi Watanabe, Chiryu; Takanobu Hirayama, Chita, and Hideo Asakura, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed July 13, 1976, Ser. No. 704,801

Claims priority, application Japan, July 17, 1975, 50-87719; July 17, 1975, 50-87720

Int. Cl.[2] B41J *33/14*

U.S. Cl. 197—151 **6 Claims**



1. A ribbon cartridge having slack preventing means, for a typewriter provided with ribbon drive means, said ribbon cartridge including a pair of ribbon housings rigidly connected to each other, each of said housings having an aperture, a pair of spools rotatably supported within said housings, said spools being operably connectable to said ribbon drive means, and a ribbon wound on said spools at the both ends thereof, a portion of said ribbon being exposed to the outside of said housings through said apertures when said ribbon is fed from one spool to the other; the improvement comprising:

a. a pair of hold members rotatably supported in said housings;

b. a holding portion on each of said hold members, said holding portion being movable across a ribbon passage within each of said housings, and co-operating with one portion of the housing for holding said ribbon;

c. a pair of spring members for biasing respective hold members toward said one portion of the housing; and

d. a pair of retract members provided in the typewriter, respectively having a cam edge to be engagable with one of said hold members for retracting said holding portions from said ribbon passage against the biasing force of said spring members, when the ribbon cartridge is installed in the typewriter, so that when said ribbon cartridge has been removed from the typewriter, said ribbon is free from slackening in the portion which is exposed to the

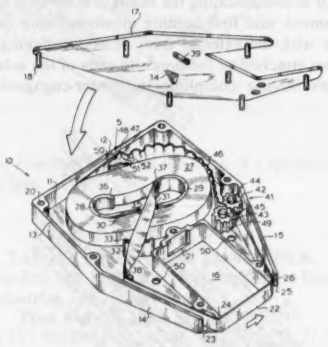
outside of said housings by the ribbon holding action of said hold members.

4,074,800

ENDLESS PRINTER RIBBON CARTRIDGE APPARATUS

James M. Steinke, Longwood, Fla., assignor to TRW Inc., Los Angeles, Calif.

Filed Apr. 4, 1977, Ser. No. 784,078
Int. Cl.[2] B41J *33/10*
U.S. Cl. 197—168 9 Claims



1. An endless printer ribbon cartridge comprising in combination:

a housing having a bottom and a plurality of sides, and formed to include a pair of protruding arms;

a top cover attached to said housing;

ribbon wrapping means fixedly attached to said housing bottom and having a pair of arcuate wrapping members for wrapping an endless ribbon around;

an endless ribbon having a partially wrapped portion wrapped around said pair of arcuate wrapping members for a plurality of turns so as to leave a space therebetween;

a ribbon guide fixedly attached to said ribbon wrapping means between said partially wrapped portion of said endless ribbon for guiding said ribbon from between said pair of arcuate wrapping members over said partially wrapped portion of said endless ribbon;

ribbon drive means located in said housing and engaging said ribbon for driving said ribbon over a predetermined path from between said ribbon wrapping means wrapping members over a predetermined ribbon path between said protruding arms and onto the outside of said partially wrapped ribbon on said ribbon wrapping means whereby an endless ribbon cartridge is formed; and

a ribbon straightening member having a plurality of lips thereon, one said lip being spaced a predetermined distance from one said housing side for metering ribbon onto said partially wrapped ribbon and for straightening said ribbon and a second said lip located adjacent to and pressing against said partially wrapped ribbon portion for maintaining said wrapped portion in a tight wrap.

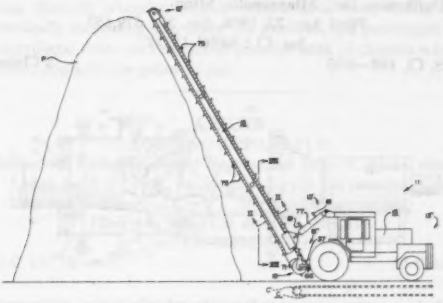
4,074,801

BULK MATERIAL RECLAIMING APPARATUS

James T. Monk, Louisville; James L. Hailey, Noxapater, and Tonnie M. Boyles, Louisville, all of Miss., assignors to Taylor Machine Works, Inc., Louisville, Miss.

Filed Oct. 4, 1976, Ser. No. 729,104
Int. Cl.[2] B65G *65/28*
U.S. Cl. 198—304 4 Claims

1. Apparatus for reclaiming bulk material from a pile of such material, said apparatus comprising: a self-propelled wheeled vehicle; elongated boom means including a first elongated substantially boxlike member having fore and aft ends, a second elongated substantially boxlike member having fore and aft ends, and means for joining said first and second boxlike members together in a spaced-apart side-by-side relationship; pivot means for pivotally mounting said aft ends of said first and second boxlike members to said wheeled vehicle; endless belt-like means movably positioned about said boom means, said endless belt-like means including a first endless chain member movably positioned about said first boxlike member of said boom means and a second endless chain member movably positioned about said second boxlike member of said boom means, each of said first and second endless chain members including a plurality of roller members; guide means attached to said boom means for guiding said endless belt means lengthwise around said boom means, said guide means including a plurality of substantially C-shaped members mounted on the upper and lower edges of said first and second boxlike members of said boom means and being inwardly directed, each of said C-shaped members having an outwardly-directed opening therethrough adjacent the lowermost portion thereof for allowing passage therethrough of the bulk material being reclaimed by said apparatus thereby alleviating any trappage within said guide means of any of the bulk material, each of



said C-shaped members mounted on the upper edges of said first and second boxlike members having a downwardly and outwardly angled bottom portion for allowing bulk material to pass through said opening thereof aided by the force of gravity, said roller members of said first and second endless chain members traveling within said C-shaped members of said guide means so that said first and second endless chain members are guided lengthwise around said first and second boxlike members respectively; drive means operatively coupled to said endless belt-like means for selectively causing said endless belt-like means to move along said boom means, said pivot means and said drive means being coaxially aligned with one another; and blade means attached to said endless belt-like means for moving with said endless belt-like means to reclaim bulk material from a pile of such material when said boom means is positioned against such a pile, said blade means including a plurality of substantially platelike blade members, each of said blade members being attached to said first and second endless chain members and extending transversely of and outwardly past said first and second boxlike members of said boom means for effecting a cave-off of the bulk material in the pile as bulk material is reclaimed from the pile.

4,074,802

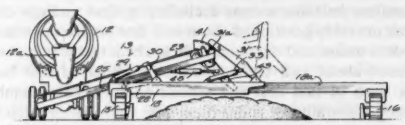
CONCRETE RECEIVER AND PLACER FOR ROAD PAVING

Michael I. Hudis, Milwaukee, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Aug. 23, 1976, Ser. No. 716,391
Int. Cl.[2] B65G *41/00*
U.S. Cl. 198—315 12 Claims

1. A belt placer comprising powered ground traction means, a frame having spaced cross-members connecting the tractions means, a belt conveyor extending paralled to and between said

cross-members, said belt conveyor having a lower loading end and an upper discharge end, first support arms pivotally carried by the frame and pivotally connected to the discharge end of the conveyor and second support arms having support



rollers supporting the loading end of the conveyor, said conveyor including two straight supporting runners which are translated on the rollers by the first support arms, and power means for moving said arms and variously positioning said conveyor.

4,074,803

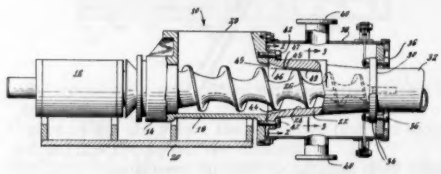
SCREW CONVEYOR HAVING STOPPER BAR MEANS

Ture Eric Kollberg, Port Chester, N.Y., assignor to American Defibrator, Inc., Minneapolis, Minn.

Filed Apr. 23, 1976, Ser. No. 679,657

Int. Cl.[2] B65G *33/14*

U.S. Cl. 198—670 **6 Claims**



1. In a screw conveyor for pulp manufacturing equipment, including feed screw means rotationally mounted within a casing defining a chamber for receiving the pulp material, a throat member connected to and extending longitudinally from said casing and having a conical bore tapering from its inlet end at the material receiving chamber towards a discharge end and being provided with a plurality of longitudinal grooves, the feed screw means extending into said bore to gently and progressively compress the material while it is being advanced therethrough by the rotation of the screw means, the improvement which enhances feeding of the pulp material while preventing the same from turning with the feed screw and thereby prevents clogging, said improvement comprising:

a. a flared peripheral portion **(44)** at the inlet end of said throat member defining a flare bore **(43)** merging with the tapered bore of the throat member; and

b. a plurality of elongate stopper bar means having a wedge profile seated in said flare bore **(43)** adjacent to and overlapping the longitudinal grooves in the throat member.

4,074,804

SCRAPER-CHAIN CONVEYORS

Dieter Gründken, Lunen, and Helmut Temme, Waltrop, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Wethmar bei Lunen, Germany

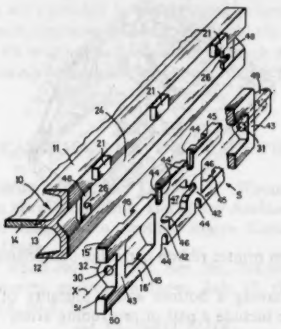
Filed Apr. 5, 1976, Ser. No. 673,486

Claims priority, application Germany, Apr. 12, 1975, 2516082; July 17, 1975, 2531861

Int. Cl.[2] B65G *19/28*

U.S. Cl. 198—735 **11 Claims**

1. A channel section for a scraper-chain conveyor comprising: side walls having V-shaped notches extending longitudinally along the exterior surfaces thereof; a floor plate extending between and connecting said side walls; an elongate structure mounted on the exterior surface of at least one of the side walls, said structure extending over substantially the entire length of the side wall and being substantially co-planar with the upper and lower surfaces thereof, said structure having vertically spaced upper and lower stiffening members interconnected at longitudinally spaced locations by first holding members extending transversely therebetween, the V-shaped notch in the exterior surface of the side wall being accessible through the spaces between said upper and lower stiffening members and said first holding members, said first holding members being engaged within the elongate V-shaped notch extending along the side wall and having slotted recesses therein for accommodating the heads of bolts used for securing an attachment, said first holding members being substantially co-planar with the exterior sides of said stiffening members; connectors attached to the opposite ends of the side wall, said connectors having complimentary inter-engageable projec-



tions and recesses for connecting one channel section to another, said connectors extending over the entire height of the side walls and being substantially co-planar with the exterior sides of said stiffening members, said connectors having bores for receiving connecting bolts used to secure adjacent channel sections together; and, second holding members provided adjacent to said connectors, said second holding members having slotted recesses serving to receive the heads of bolts and being engaged in the V-shaped notch on the side wall, said second holding members being smaller than said first holding members and having a maximum height substantially the same as the maximum width of the V-shaped notch and a width such that the outermost sides are substantially co-planar with the exterior of the side wall to thereby permit connecting bolts to be located in the connectors.

4,074,805

INSTALLATION EQUIPMENT WITH A DRIVING MECHANISM

Hermanus J. A. Bodewes, Uden, Netherlands, assignor to Rapistan Incorporated, Grand Rapids, Mich.

Filed Oct. 12, 1976, Ser. No. 731,824

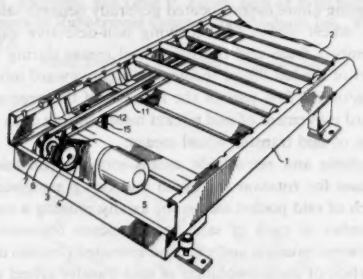
Claims priority, application Netherlands, Dec. 8, 1975, 7514253

Int. Cl.[2] B65G *13/02*

U.S. Cl. 198—790 **9 Claims**

1. An endless propelling means for a power driven conveyor, said propelling means having an endless chain and an elastic strip, said chain having a plurality of links each having an opening extending through the chain, said elastic strip having an elongated body, a plurality of anchor elements integral with and projecting from one face thereof and seated in openings in said links, said anchor elements each having an enlarged head and a reduced shank, said shank being of a size to be snugly received in one of said openings; said anchor elements

being spaced apart twice the length of one of said chain links whereby only alternate ones of said openings are occupied by



said anchor elements to permit the teeth of a sprocket to mesh with said chain.

4,074,806

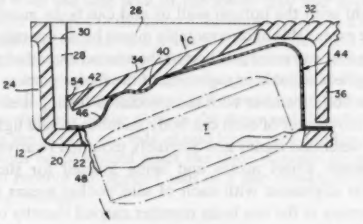
TABLET DISPENSING CONTAINER

Gerald J. Ardito, Old Westbury, N.Y., assignor to Deena Packaging Industries, Inc., Ridgewood, N.Y.

Filed Feb. 18, 1977, Ser. No. 770,010

Int. Cl.[2] B65D *83/04, 85/56, 47/04;* **G07F** *11/00*

U.S. Cl. 206—531 **5 Claims**



1. An integral thermoplastic tablet dispensing container which comprises:

a body member including a bottom wall, side walls and end walls, said bottom wall being formed with a plurality of preselectedly spaced slots, said side walls being formed with a plurality of preselectedly spaced columns;

a cover member hingeably connected to said body, said cover member formed with a T-shaped top member having preselectedly spaced laterally extending tablet dispensing elements correspondingly positioned with respect to said slots formed in said bottom wall of said body member, said tablet dispensing elements resting on said column in a closed position of said container; and

means for locking said cover member to said body member.

4,074,807

APPARATUS FOR FEEDING OBJECTS TO A POINT OF USE

Anthony John Goulds, London, England, assignor to Gunson's (Mineral & Automation) Limited, London, England

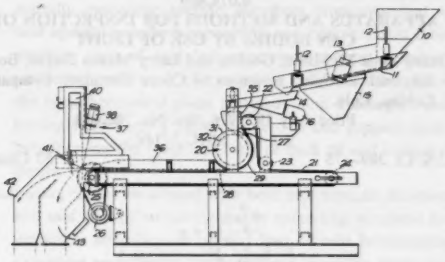
Filed June 17, 1976, Ser. No. 697,246

Claims priority, application United Kingdom, June 27, 1975, 27295/75

Int. Cl.[2] B07C *9/00, 1/02*

U.S. Cl. 209—73 **3 Claims**

1. Apparatus for feeding objects to a point of use comprising a drum, means for feeding objects to the drum, an endless belt which is disposed closelyadjacent to and in contact with a portion of the drum, and which has a vertically extending and a horizontally extending run upstream and downstream respectively of the drum, and means for driving the belt and the drum in unison, the drum having a plurality of parallel, circumferentially extending grooves which are arranged longitudinally of the said horizontally extending run and through which the objects may freely pass longitudinally and the objects in the



grooves being centrifugally forced against the belt in parallel rows as the belt moves between the vertical and horizontal runs thereof, whereby objects which have been fed to the vertically extending run enter the grooves, are positioned by centrifugal force on the belt in parallel lines of objects which travel towards the point of use.

4,074,808

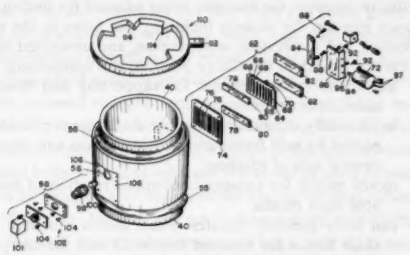
SORTING APPARATUS

Robert M. Gillespie, Grand Rapids, and John R. Ricks, Grand Ledge, both of Mich., assignors to Cypro Corporation, Grand Rapids, Mich.

Filed Apr. 30, 1976, Ser. No. 681,411

Int. Cl.[2] B07C *5/342*

U.S. Cl. 209—73 **17 Claims**



1. A sorting apparatus comprising a chamber including open ends through which articles to be sorted are individually passed for optically sorting the articles;

means for illuminating said chamber;

light reflecting background means positioned on the side of said chamber and forming an adjustable reference standard of reflectivity, said reflecting means including a first member having alternately spaced stripes of different light reflecting characteristics, a second member positioned over said first member and having a series of spaced slots formed therein, said slots corresponding generally to alternate spaced stripes formed on said first member, and means for moving one of said first and second members with respect to the other of said members to adjust the reflectivity of said background means by selectively exposing said segments through said apertures to establish a predetermined background level; and

detection means positioned on said chamber opposite said background means to receive light reflected from said background means to establish a reference level and including, lens means focusing said detection means on objects passing through said chamber approximately mid-

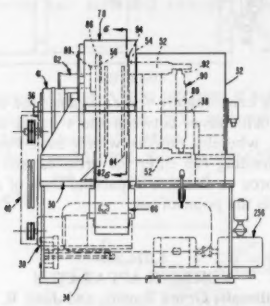
way between said detection means and said background means whereby a change in detected light level from said reference level is indicative of a property of an article to be sorted for effecting sorting of the article.

4,074,809

APPARATUS AND METHODS FOR INSPECTION OF CAN BODIES BY USE OF LIGHT

Danny Leon McMillin, Golden, and Larry Mason Dugan, Boulder, both of Colo., assignors to Coors Container Company, Golden, Colo.

Filed July 19, 1976, Ser. No. 706,478
Int. Cl.[2] B07C 5/344
U.S. Cl. 209—75 **57 Claims**



1. A machine for continuous testing of one piece can body members having a sidewall portion, and a bottom wall portion at one end defining a container cavity, and an opening at the other end, and a formed flange portion at the other end surrounding the opening for subsequent association with a can closure member; the machine being adapted for testing the can body member for defects including pin holes in the sidewall portion and the bottom wall portion, and unwanted deformation and cracks in the flange portion, and comprising:

frame and housing means for supporting and housing the machine components;

horizontally extending rotatable shaft means rotatably supported by said frame and housing means and providing a central axis of rotation;

motor means for causing continuous rotation of said rotatable shaft means;

can body member transfer wheel means mounted on said shaft means for rotation therewith and for carrying can body members in a circular path thereabout;

a plurality of pocket means circumferentially spaced about the outer periphery of said transfer wheel means for receiving a can body member in each pocket means and for transferring each can body member along said circular path during a portion of each revolution of said transfer wheel means, each of said pocket means being carried generally upwardly during 180° and generally downwardly 180° during each revolution of said transfer wheel means;

in-feed means mounted on said frame and housing means for loading one can body member in each of said pocket means during the last 90° of the generally upward movement of said pocket means during each revolution of said transfer wheel means;

light applying means for applying light to the exterior surfaces of each can body member in each of said pocket means, the light applying means being non-rotatably mounted relative to said transfer wheel means and located to provide a continuous light zone during the first 90° of the generally downward movement of said pocket means during each revolution of said transfer wheel means;

discharge chute means for receiving defective can body members from said transfer wheel means during the last 90° of the generally downward movement of said pocket means during each revolution of said transfer wheel means;

unloading chute means located generally beneath said transfer wheel means for receiving non-defective can body members from said transfer wheel means during the last part of the last 90° of the generally downward movement and/or the first part of the first 90° of the generally upward movement of said pocket means during each revolution of said transfer wheel means;

extendable and retractable means mounted on said shaft means for rotation therewith and being associated with each of said pocket means for axially moving a can body member in each of said pocket means between a first retracted position and a second extended position during a portion of each revolution of said transfer wheel means;

releasable holding means associated with each of said extendable and retractable means for abutting and releasable holding engagement with the bottom wall portion of a can body member in each of said pocket means during a portion of each revolution of said transfer wheel means;

sealing means mounted on said shaft means for rotation therewith and being associated with each of said pocket means and each of said extendable and retractable means for sealable engagement with the flange portion of non-defective can body members carried in each of said pocket means and releasably held by said holding means, the holding means being operative to effect holding engagement with the bottom wall of said can body member and the extendable and retractable means being operative from the first retracted position to the second extended position to effect sealable engagement of the flange portion of each can body member with the associated sealing means prior to movement of each can body member to said light zone;

light detection means non-rotatably mounted relative to said transfer wheel means and being located for successive axial alignment with each of said pocket means and the opening in the can body member carried thereby opposite said sealing means in the light zone for receiving light only from said light applying means through the can body member and between the flange portion and the sealing means and for generating a control signal upon receipt of light therefrom;

said extendable and retractable means being operative from the second extended position to the first retracted position to retract each can body member from sealable association with said sealing means after downward movement beyond said light detection means prior to reaching said discharge chute means during each revolution of said transfer wheel means;

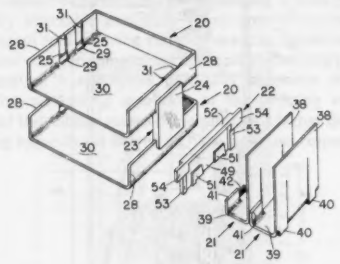
defective can body member release control means effective in response to said control signal from said light detection means for releasing each defective can body member after beginning the first part of the last 90° of the generally downward movement of said transfer wheel means and before reaching said discharge chute means during each revolution of said transfer wheel means and for enabling downward discharge of defective can body members into said discharge chute means by centrifugal force of said transfer wheel and force of gravity; and

non-defective can member release control means effective as each non-defective can body member approaches said unloading chute means for releasing each non-defective can body member and for enabling discharge of non-defective can body members into said unloading chute means by centrifugal force and force of gravity during each revolution of said transfer wheel means.

4,074,810
COMBINATION TIERED LETTER TRAY AND VERTICAL FILE

David A. Juergens, and Greg P. Terek, both of Winchester, Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.

Filed Sept. 27, 1976, Ser. No. 727,227
Int. Cl.[2] A47F 7/00
U.S. Cl. 211—11 9 Claims

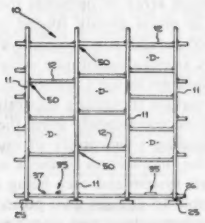


1. A combination tiered letter tray and vertical file comprising at least two tiered U-shaped trays each having a bottom wall and side walls with equally spaced-apart slots at the intersections thereof, riser plate members supporting the upper tray on the lower tray and having a bottom groove detachably engaged over the side wall of the lower tray and upper tabs detachably engaged in the slots of the upper tray, and a vertical file comprising at least one L-shaped trough having a bottom wall and side wall with spaced-apart slots at the intersection thereof and spaced-apart upright tabs at the opposite edge of its bottom wall, the upright tabs of said trough being spaced apart the same distance as the slots in the trays and detachably engaged in the slots at one side of said lower tray and the slots of said trough being spaced apart the same distance so as selectively to receive the upright tabs of a like trough in laterally adjoining relation.

4,074,811
MULTI-LEVEL KNOCK-DOWN FRAMEWORK STRUCTURE FOR SUPPORTING A PLURALITY OF OBJECTS

Andrew M. Filak, 4108 Seahorse Lane, Portuguese Bend, Calif. 90274

Filed Oct. 15, 1975, Ser. No. 622,725
Int. Cl.[2] A47B 43/00
U.S. Cl. 211—191 13 Claims



1. A multi-level portable knock-down framework structure for supporting a plurality of objects of varying shapes, sizes and weights in individual compartments comprising:

a first plurality of spaced upright support members;

a second plurality of spaced support members, said first plurality of support members removably interconnecting said upright members forming a generally rectangular framework having a front, back and interconnected sides with a plurality of vertical generally rectangularly shaped rows disposed within said framework, each of said rows having an upright member at each corner thereof and divided into a plurality of vertically spaced compartments, each of said compartments having generally horizontally extending support members interconnected to said upright members separating one compartment from another, two of said last-mentioned support members associated with each compartment lying substantially in the same horizontal plane and providing a compartment having a front and a back, said two of said support members forming the front and back of each of said compartments;

adjusting means associated with both said upright members and said two of said horizontally extending members for vertically adjusting all of said two of said horizontally extending members at predetermined locations along said upright members;

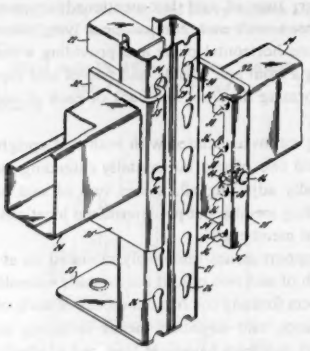
object support means removably mounted on at least some of both of said two of said horizontally extending support members forming the front and back of each of said compartments, said adjusting means including said upright support members having at least one generally T-shaped slot opening outwardly thereof and extending substantially the entire length thereof along one side thereof, said horizontally extending members being secured to said upright support members by non-biased tension bolts having heads movable along said slot, said heads and said slots including retaining means thereon for retaining said horizontally extending members at various locations along said slots in said upright support members, said retaining means including said T-shaped slot having relatively flat inner walls and relatively flat side walls extending generally perpendicular to said inner walls, said walls retaining means further including said heads having a pair of oppositely opposed surfaces interconnected by a pair of oppositely opposed straight surfaces, and said head being undercut forming flattened portions extending from a point at the outer periphery of the underside of the head of each of said bolts to a point adjacent the shank of each of said bolts forming an abutting shoulder thereat so that, when said bolts are disposed in said T-shaped slots, said heads are cammed about said camming surfaces with said camming surfaces abutting against the inner walls of the cross-leg of said T-shaped slots and said flattened portions abut against the flat inner walls of the leg of said T-shaped slots with the shoulders abutting against the perpendicular portions of said slots; and

interconnecting means removably interconnecting both of said two of said horizontally extending support members to said upright members, said interconnecting means including a generally flat flange having a generally U-shaped bracket extending from one face of said flange, one of the legs of said bracket being substantially shorter than the other, the ends of each of said two of said horizontally extending support members connected to said upright members having blocks press-fit in each end therein, each of said ends being insertable within said bracket and abutting against the face thereof from which said bracket extends, the opposite face of said flange being secured to an upright member, and securing means associated with said blocks, said ends of said horizontally extending support members, and said bracket for fixedly securing said last-mentioned ends in said brackets.

4,074,812
PALLET RACK

Leroy F. Skubic, LaPorte; Lucius B. Donkle, Jr., Michigan City, and Donald L. Groth, LaPorte, all of Ind., assignors to The Paltier Corporation, Michigan City, Ind.

Filed Dec. 11, 1975, Ser. No. 640,022
Int. Cl.[2] A47F 5/10
U.S. Cl. 211—192 **6 Claims**



1. In a vertically adjustable pallet rack having at least four rectangularly spaced vertical support posts and pairs of spaced horizontal shelf beams mounted between corresponding pairs of said posts, each said post having a front wall and rearwardly extending side walls facing each other, the combination comprising:

a. a post-to-beam connector fixed to the end of each horizontal shelf beam, said connector having a first wall attached to the shelf beam;

b. a second wall laterally spaced from said first wall;

a bridge wall connecting said first and second walls;

d. means defining two vertically disposed series of keyhole shaped apertures in the front wall of each post, said series being spaced from each other and from the side walls of the post,

e. each said aperture having a relatively wide upper portion of generally circular shape and a narrower lower portion defined by a vertical side adjacent the central portion of said post and an inclined side tapering downwardly to an arcuate bottom wall portion connecting said vertical and inclined sides;

f. at least two vertically spaced hooks defined in said second wall of said connector for engagement with the apertures of the post, said hooks lying in a common plane;

g. each said hook having a throat and a bulbous projection above said throat adapted to engage the vertical wall of the aperture while said throat engages the arcuate bottom wall portion of the aperture at a point spaced vertically below said bulbous projection on the opposite side of said hook therefrom above the bottom of the aperture in a direction generally normal to said arcuate bottom wall portion; and

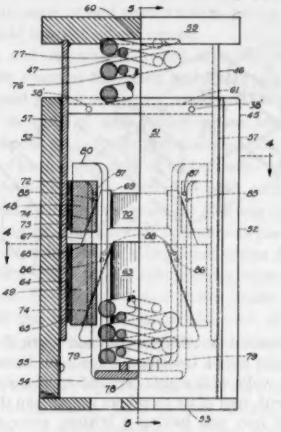
h. said first wall of said connector defining a clearance space with respect to the side of said post when said connector is attached to said post.

4,074,813
TELESCOPIC DRAFT GEAR

David G. Anderson, Chesterton, Ind., assignor to Miner Enterprises, Inc., Chicago, Ill.

Filed Oct. 15, 1976, Ser. No. 732,910
Int. Cl.[2] B61G 11/14
U.S. Cl. 213—24 **12 Claims**

10. In a railway draft gear including a housing having inner wall means defining a cavity therein extending along a longitudinal axis and having an open end and a substantially closed end, a plunger extending at least partially into the cavity and mounted for reciprocal movement with respect to the housing as forces are applied to the two spaced ends of the plunger and housing respectively, and a device, including friction elements and spring elements, within the cavity for resiliently and frictionally resisting forces acting on the draft gear to force the plunger into the housing, said draft gear being characterized by:



said plunger being guided in said housing for movement along said longitudinal axis both at a location adjacent the open end of the cavity and at a location adjacent the closed end of the cavity thereby reducing the tendency of the plunger to cock with respect to the housing, that is, to become misaligned with respect to said axis; and

said friction elements being at least in part positioned adjacent the closed end of the cavity.

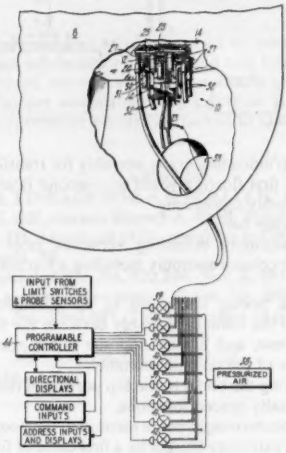
4,074,814
METHOD AND APPARATUS FOR CONTROLLING SURFACE TRAVERSING DEVICE

David Eugene Cooper, Rossville, Ga.; Leon Clyde Hendee, III, Chattanooga, Tenn.; Walter Guy Hill, Jr., Rossville, Ga.; Adam Leshem, West Hartford, and Martin Lewis Marugg, Enfield, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 26, 1976, Ser. No. 670,806
Int. Cl.[2] B25J 9/00
U.S. Cl. 214—1 BB **25 Claims**

13. For use in traversing the surface of a member, the member having an ordered array of openings therein aligned and uniformly spaced in plural evenly spaced parallel lines and plural evenly spaced parallel rows respectively parallel to the *x* and *y* axes of a Cartesian coordinate system, each opening having a separate address in the Cartesian coordinate system, in combination, a surface traversing apparatus including first and second interconnected stepping arms, the first and second stepping arms extending transversely of one another at the angle defined by the intersection of the *x* and *y* axes of the Cartesian coordinate system and each being selectively longitudinally reciprocable to at least two positions, the distance between the respective at least two positions of the first and second stepping arms corresponding respectively with an integer multiple of the spacing along the respective axis between adjacent lines and adjacent rows of member openings respectively, signal controlled drive means connected to the first and second stepping arms to selectively step either or both of the first and second stepping arms transversely of the other each to a respective selected one of the respective at least two positions, first and second anchor means connected to the first and second stepping arms respectively, each of the first and

second anchor means being selectively insertable into and alternately retractable from member openings for respectively engaging and disengaging the respective first and second stepping arms with the member, signal controlled drive means connected to the first and second anchor means for selectively engaging and alternately disengaging either of the first and second stepping arms with the member; and control apparatus for controlling the movement of the surface traversing apparatus comprising means for sensing the positions of the first and second stepping arms relative to one another and generating signals indicative thereof, means providing a multiplicity of alternately selectable executory move control routines, each move control routine being responsive to the signals indicative of the relative positioning of the first and second stepping arms for generating a respective particular sequence of control signals for controlling operation of the stepping arm drive means and the anchor means drive means such that the surface traversing apparatus is moved an increment in a respective one



of a multiplicity of different directions within the Cartesian coordinate system, each move increment advancing the surface traversing apparatus reference point relatively from a present member opening to at least the next adjacent member opening in the direction of movement by sequentially at least disengaging a particular one of the first and second stepping arms with respect to the member, driving at least one of the first and second stepping arms to a respective one of its at least two positions to move the disengaged particular stepping arm and normally re-engaging the disengaged particular one of the stepping arms with respect to the member, a first one of the move directions being parallel to one of the axes of the Cartesian coordinate system, a second one of the move directions being parallel to the other axis of the Cartesian system and a third one of the move directions extending diagonally of the axes of the Cartesian coordinate system, and means for selectably connecting the stepping arms drive means and the anchor means drive means with the sequenced control signals of a selected one of the executory move control routines.

4,074,815

TURN-OVER COOLING BED FOR BAR-SHAPED ROLLED MATERIAL, PARTICULARLY BILLETS

Karlheinz Varwig, Mulheim, Germany, assignor to DeMag Aktiengesellschaft, Duisburg, Germany

Filed Feb. 13, 1976, Ser. No. 657,857
Claims priority, application Germany, Feb. 18, 1975, 2506703
Int. Cl.[2] G65G 7/00
U.S. Cl. 214—1 QG **2 Claims**

1. A cooling bed for simultaneously conveying and turning hot semi-soft straight-edged rolled material such as billets while maintaining continuous non-tumbling support thereof, the improvement comprising:

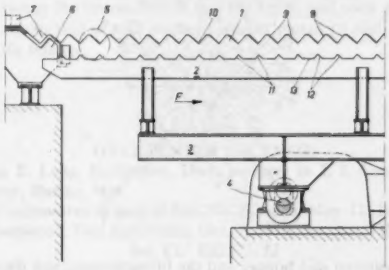
(a) a stationary rake with teeth;

(b) a movable rake with teeth;

(c) means connected to said movable rake for moving said movable rake parallel to the longitudinal axis of said stationary rake; characterized by

(d) said moving means moving said movable rake in a closed circular path;

(e) the angle of inclination from horizontal of the rising flanks and falling flanks of the teeth of said movable and stationary rakes being the same;



(f) the angle of said rising flanks of said teeth being steeper than said falling flanks;

(g) the flanks of adjacent teeth in said stationary rake forming angles of about 90 degrees with each other;

(h) said teeth in said movable rake being spaced from each other to form horizontal bearing surfaces at the base of said teeth; and

(i) said horizontal bearing surfaces being wider than the straight edges of the rolled material to be conveyed and turned;

(j) said horizontal bearing surfaces, together with said teeth in said movable and stationary rakes, providing continuous non-tumbling support of said semi-soft rolled material.

4,074,816

CHARGE METERING APPARATUS FOR SHAFT FURNACES

Edouard Legille, Luxembourg, Luxembourg, assignor to S.A. des Anciens Etablissements Paul Wurth, Luxembourg, Luxembourg

Filed Mar. 6, 1973, Ser. No. 339,118
Claims priority, application Luxembourg, Mar. 6, 1972, 64910
Int. Cl.[2] B65G 69/00
U.S. Cl. 214—2 **12 Claims**

1. Apparatus for use in the delivery of materials to the interior of a shaft furnace, said furnace having a vertical axis and operating with a high counter-pressure, said apparatus comprising:

at least one storage hopper for providing intermediate storage for a charge of material to be delivered to the furnace, said storage hopper having a supply port and a discharge port;

weighing means associated with said storage hopper;

means pivotally supporting said storage hopper on said weighing means;

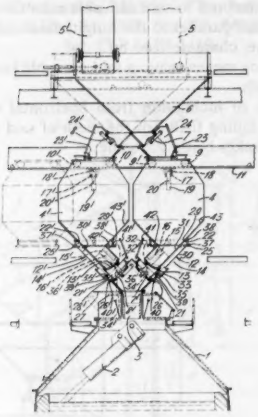
means defining a discharge channel for said storage hopper;

first flexible coupling means connecting the first end of said discharge channel defining means to said storage hopper;

means for delivering material discharged from said storage hopper through said discharge channel defining means to the furnace, said delivering means including material flow control valve means, said delivering means being mounted on the furnace; and

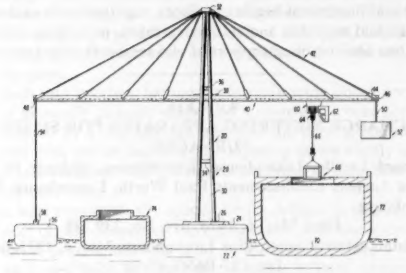
second flexible coupling means for connecting the second end of said channel defining means to said delivering

means, said first and second flexible coupling means and said supporting means cooperating to define a suspension for said hopper which converts differential displacements



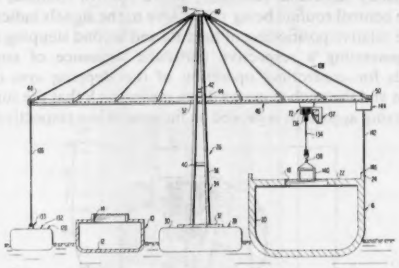
between said hopper and the furnace to angular displacements which do not significantly degrade the accuracy of measurements provided by said weighing means.

4,074,817
BARGE CABLE CRANE
Louis F. Ray, P.O. Box 14702, Baton Rouge, La. 70808
Filed Mar. 22, 1976, Ser. No. 668,996
Int. Cl.[2] B63B *27/00;* B66C *23/52*
U.S. Cl. 214—13 **5 Claims**



4. A waterborne crane comprising:
a crane barge having a tower extending vertically therefrom;
a horizontal gantry mounted at an intermediate point thereof on the tower;
cargo transfer means mounted on said gantry for horizontal movement between the opposite ends of said gantry through said intermediate point, and including a hoist mechanism;
a first counterweight suspended from one end of the gantry; and
a buoyant counterweight barge and a flexible cable connecting the other end of the gantry to said buoyant counterweight barge so that said buoyant counterweight barge provides a counterbalance effect on said waterborne crane through a tension force on said flexible cable when said cargo transfer means is located on one side of said intermediate point, said first counterweight being effective to provide a counterbalance effect on said waterborne crane when said cargo transfer means is on the other side of said intermediate point, said cargo transfer means when located on said other side being effective to relieve said tension force in said flexible cable thereby rendering said buoyant counterweight barge ineffective.

4,074,818
LOADING/UNLOADING CRANE WITH BUOYANT COUNTERWEIGHT SYSTEM
Louis F. Ray, P.O. Box 14702, Baton Rouge, La. 70808
Filed Mar. 5, 1976, Ser. No. 664,119
Int. Cl.[2] B63B *27/00;* B66C *23/52*
U.S. Cl. 214—13 **5 Claims**



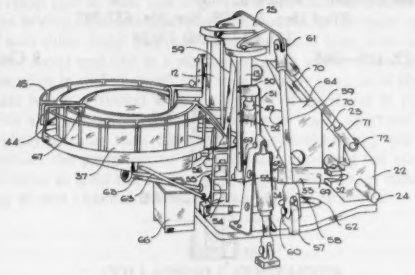
1. A loading/unloading crane assembly for transfer of cargo from a loaded first floating vessel to a second floating vessel, the crane assembly comprising:
a floating crane barge;
a column assembly extending vertically from the crane barge, the column assembly including a top portion, and a base;
a horizontal boom, connected at an intermediate point thereof to the column assembly between the top portion and the base, and having opposite outer extremities on either side of the column assembly;
means securing the boom to the top portion of the column at longitudinally spaced locations;
a floating counterweight barge secured to the boom adjacent one outer extremity thereof by a first cable of fixed length;
the first loaded vessel being located between the crane barge and the counterweight barge;
a second cable of adjustable length securing the opposite outer extremity of the boom to the second vessel; and
movable trolley means on the boom, including a vertically movable hoist cable with cargo engagement means, for withdrawal of cargo from the loaded first vessel, movement through said intermediate point, and placement of the cargo in the second vessel, the cable of adjustable length being lengthened as the second vessel takes on cargo.

4,074,819
ELEVATABLE TWO-PART SCAFFOLD FOR PICKING FRUIT
Abel S. Labourre, 8290 Berg St., Roseville, Calif. 95678
Filed Mar. 31, 1976, Ser. No. 672,247
Int. Cl.[2] E04G *1/18*
U.S. Cl. 214—83.1 **13 Claims**

1. A scaffold for picking fruit from a tree comprising:
a support base;
a pair of movable generally semi-circular hopper assemblies mounted on said base;
hopper assembly moving means associated with said base for moving both of said hopper assemblies thorugh a generally horizontal plane from a first open position whereby said assemblies may be brought into a position encircling a tree to a second closed position completely encircling said tree;
fruit receiving means associated with each of said hopper assemblies for receiving fruit picked from said tree consisting of a continuous bin disposed along the inner side

surfaces of said assemblies and extending substantially 360° around said tree when said assemblies are in said closed position;

walk means associated with each of said hopper assemblies



adjacent said fruit receiving means for permitting a picker to walk substantially 360° around said tree and pick fruit therefrom; and means for independently elevating each of said hopper assemblies along a vertical hopper assembly support member pivotally attached to said base.

4,074,820

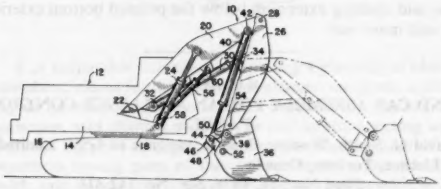
SHOVEL LINKAGE FOR A HYDRAULIC EXCAVATOR

Stephen H. Gill, Aurora; Harvey A. Knell, Joliet, and Joseph M. Tucker, III, Aurora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 522,204, Nov. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 283,621, Aug. 24, 1972, Pat. No. 3,862,697. This application May 25, 1976, Ser. No. 689,780

Int. Cl.² E02F *3/32*

U.S. Cl. 214—138 R **8 Claims**



1. A hydraulic excavator, comprising:

a vehicle having a mobile carriage and a rotary platform supported for rotation about a vertical axis on said carriage;

a boom having an inner and outer end, pivotally supported at said inner end of said rotary platform adjacent said vertical axis for movement about a horizontal axis;

a pair of boom lift cylinders pivotally mounted at one end to said rotary platform forward of and slightly below the connection of said boom thereto, and said cylinders being connected at the other end to said boom approximately midway between the ends thereof;

a stick having an inner end and an outer end and pivotally connected at the inner end to the outer end of said boom;

a stick cylinder pivotally connected at one end to said boom adjacent the inner end thereof and connected at the other end to said stick;

a bucket pivotally connected to the outer end of said stick and opening outwardly away from said vehicle; and

bucket cylinder means pivotally connected at one end directly to said boom adjacent to the outer end thereof and connected at the other end to tilt linkage for tiling said bucket with respect to said stick, said tilt linkage being arranged for applying a forward force to said bucket, said bucket cylinder means together with said stick forming opposite sides of substantially a parallelogram and the force applied by the bucket cylinder means directly creating a moment about the connection of the stick to the boom, the connection of said bucket cylinder means to said boom being spaced inward from the connection of the stick to the end of the boom so that the moment about the pivotal connection of the stick to the boom when the bucket cylinder means are being extended tends to directly pivot the stick outward from the vehicle, the direct connection of said bucket cylinder means to said boom being spaced from the connection of said stick to said boom a distance substantially equal to the distance between the connection of said bucket to said stick and the connection of said bucket cylinder means to said bucket tilt linkage.

4,074,821

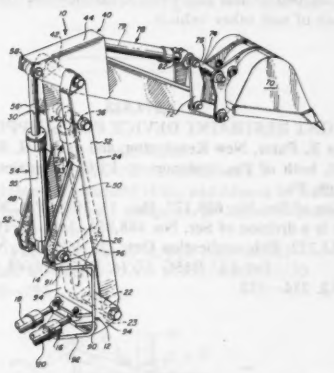
OVERCENTER BACKHOE

Elton B. Long, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Continuation-in-part of Ser. No. 576,625, May 12, 1975, abandoned. This application Oct. 7, 1976, Ser. No. 730,598

Int. Cl.² E02F *3/32*

U.S. Cl. 214—138 R **6 Claims**



1. In a backhoe arrangement, a vertically extending elongated support attachment having a mounting portion thereon defining upper and lower horizontal pivot axes, an elongated boom comprising two transversely spaced rectangular hollow boom sections and having a sleeve extending therebetween at one end, said sleeve defining a rigid interconnection between said hollow boom sections, and being pivoted on said lower pivot axis through a neutral intermediate position wherein said boom sections extend substantially vertically so that said upper pivot axis is located in a space between said sections, a pair of aligned sleeves secured to respective boom sections intermediate opposite ends with a shaft extending through said sleeves, a double-acting boom cylinder assembly including a cylinder pivotally mounted on said upper pivot axis a piston rod pivoted on said shaft to extend in said space between said boom sections, said boom cylinder assembly being extendable and retractable to effect pivotal movement of said boom and said cylinder assembly on said lower pivot axis to either side of said neutral intermediate position, and a material handling unit having a portion received between said opposite ends with a bearing member defined in said portion, and shaft means received in said bearing means or rigidly interconnecting the opposite ends of said boom sections and pivotally mounting said material handling unit on said opposite ends of said boom section.

4,074,822

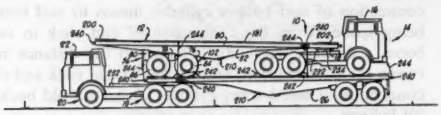
METHOD AND APPARATUS FOR TRANSPORTING ONE VEHICLE BY ANOTHER

Finis Lavell Chisum, Rte. 5, Woodcrest Heights, Claremore, Okla. 74017

Continuation-in-part of Ser. No. 336,869, Feb. 28, 1973. This application June 14, 1976, Ser. No. 695,374

Int. Cl.[2] B60P *3/00*

U.S. Cl. 214—152 **2 Claims**



1. A method for transporting one vehicle having an operator's cab and a load bed on another similar vehicle having an operator's cab and a load bed comprising the steps of:

shortening the wheel base of said one vehicle and simultaneously

raising the rear end of the load bed of said one vehicle; and

loading said one vehicle onto the load bed of the other vehicle with said one vehicle in a shortened wheel base status in which the wheels of said one vehicle rest upon the load bed of said other vehicle and the rear end of the load bed of said one vehicle extends over the operator's cab of said other vehicle.

4,074,823

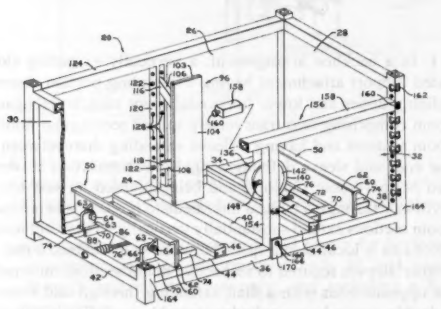
FRONT RESTRAINT DEVICE FOR SHIPPING BINS

Walter E. Pater, New Kensington, and James R. Rowley, Freeport, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 639,727, Dec. 11, 1975, Pat. No. 4,010,848, which is a division of Ser. No. 488,851, July 15, 1974, Pat. No. 3,963,122. This application Oct. 22, 1976, Ser. No. 734,850

Int. Cl.[2] B65G *57/16;* **B65D** *85/48*

U.S. Cl. 214—152 **4 Claims**



1. In a method of containing sheets in a shipping rack of the type having a back wall secured to a base wherein the method includes the step of loading the sheets on the base tilted toward the back wall, the improvement comprising:

providing a rigid member having a threaded shaft operatively connected to biasing means;

securing the rigid member on the rack spaced from outermost loaded sheet;

rotating the shaft to move the shaft into engagement with the outermost sheet; while

compressing the biasing means by way of the shaft as the shaft is rotated.

4,074,824

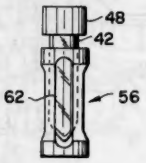
CONTAINER FOR STORAGE AND SHIPMENT OF CHEMICAL STANDARDS, RADIOACTIVE ISOTOPES AND THE LIKE

James Constantine Kontes, Vineland, N.J., assignor to Kontes Glass Company, Vineland, N.J.

Filed Dec. 3, 1975, Ser. No. 637,397

Int. Cl.[2] B65D *15/24*

U.S. Cl. 215—365 **9 Claims**



1. A composite container particularly suited for storage and shipment of chemical standards, radio-active materials in the nature of isotopes, and the like, comprising an inner thin walled hollow transparent glass vial having a smooth surfaced interior terminating in a significantly pointed interior bottom, said vial having a likewise pointed exterior bottom, the wall of said vial having a substantially uniform wall thickness throughout its length, an outer cover constituting a protective safety shield and vial holder, said vial being inserted in said outer cover and retained therein, said outer cover surrounding said inner vial and extending below the pointed bottom exterior of said vial, with said bottom exterior being thereby spaced upward from the bottom of said outer cover thereby providing protection for said pointed end and a means of standing said vial upright and providing support to the overall composite container in this position said outer cover having a plurality of longitudinally extended openings through the side wall thereof terminating short of the upper and lower ends thereof to permit visibility of contents in said inner vial, the lower end of at least one said opening extending below the pointed bottom exterior of said inner vial.

4,074,825

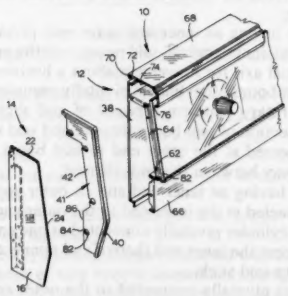
END CAP ASSEMBLY FOR AN APPLIANCE CONTROL PANEL

David G. Smith, Weston, Canada, assignor to GSW Limited/-Limitee, Toronto, Canada

Filed Nov. 16, 1976, Ser. No. 742,374

Int. Cl.[2] B65D *7/00, 7/42*

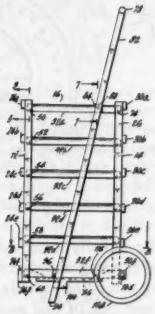
U.S. Cl. 220—4 R **6 Claims**



1. An end cap assembly for an appliance control panel assembly comprising a sheet metal end cap having attached thereto a molded plastic trim plate, said sheet metal end cap having an outer and inner surface and at least one edge, said trim plate having a broad planar portion overlying the inner

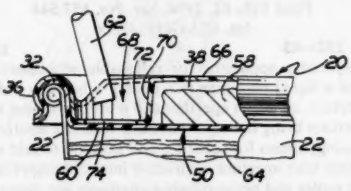
surface of said sheet metal end cap adjacent to and along the length of said at least one edge, said trim plate being molded at its periphery with an overturned edge along the edge of the trim plate corresponding to the at least one edge of the sheet metal end cap to provide a channel adapted to receive and envelop said at least one edge and a plurality of spaced apart pins having enlarged head portions secured to the inner surface of said sheet metal end cap for holding said trim plate on said sheet metal end cap in a manner so as to position said at least one edge in said channel, said broad planar portion of the trim plate being provided with a plurality of apertures in register with said plurality of pins, the size of each aperture being slightly greater than the size of a corresponding pin head portion, the periphery of the apertures engaging the pin head portions to hold the at least one edge of said sheet metal end cap in said channel when said trim plate is attached.

4,074,826
COLLAPSIBLE CONTAINER
Dov Lewanoni, 1187 E. 8th St., Brooklyn, N.Y. 11230
Filed June 10, 1976, Ser. No. 694,899
Int. Cl.[2] B65D *7/24, 7/20*
U.S. Cl. 220—6 **4 Claims**



1. A collapsible container comprising a plurality of channel members, means for mounting said channel members, a plurality of interconnecting members of substantially convex construction, said channel members or said interconnecting members having pairs of aligned openings therein the other of said members having pairs of stub axles integrally formed therewith, said interconnecting members being compressible so that said stub axles are received within said pairs of aligned openings to pivotally interconnect said interconnecting members between two opposed channel members.

4,074,827
MULTI-PURPOSE CLOSURE FOR CONTAINERS
Jacob Labe, III, 421 Ashbourne Road, Elkins Park, Pa. 19117
Filed Aug. 31, 1976, Ser. No. 719,303
Int. Cl.[2] B65D *77/20*
U.S. Cl. 220—23 **2 Claims**



1. A closure for a container, said container having a flanged mouth, said closure comprising a base member and a cover member releasably secured together for repeatable releasable securement as a unit on the mouth of said container, said base member having a central portion and a peripheral flange, said flange being configured to snap-fit over the flanged mouth of the container, said cover member having a central portion and a recessed peripheral flanged portion for receipt of the peripheral flange of the base member, said cover member being disposed over said base member with the central portions of said members being spaced apart and defining a cavity therebetween for receipt of an article, the releasable securement of said cover member and base member being effected by the receipt of the peripheral flange of the base member within the recessed flanged portion of the cover member, said cover member being replaceably removable from said base member to provide ready access to said cavity without removing the base member from said container, said closure including means enabling a straw to be extended therethrough and into said container, said means comprises an opening in said cover member and an aligned opening in said base member, through which aligned openings the straw can be inserted into the container when said cover member and base member are connected together, said opening in said base member comprising a cross-cut slit and wherein the opening in said cover member is a circular hole and wherein the central portion of the cover member contiguous with said hole is in the form of a disc-like depression including a flanged portion abutting the central portion of the base member contiguous with said slit.--

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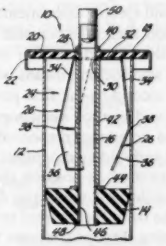
4,074,828
SEALING PLUG ASSEMBLY
Walter E. Haines, Bloomfield Hills, and Mason E. Richardson, Warren, both of Mich., assignors to Estan Manufacturing Company, Troy, Mich.
Filed Dec. 16, 1976, Ser. No. 751,012
Int. Cl.[2] B65D *43/08, 51/18;* **F16L** *55/10*
U.S. Cl. 220—254 **8 Claims**

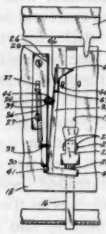


1. A sealing plug assembly for closing and sealing a cylindrical tubular member comprising: a frustum-shaped sealing plug, a support member supporting said sealing plug for complete insertion into the tubular member, a cap member supported by said support member for closing the end of the tubular member and for limiting the amount of travel of said sealing plug into the tubular member, said cap member being spaced apart from said sealing plug, and locating means for squarely locating said sealing plug in said tubular member to maintain the desired orientation of said sealing plug in said tubular member by resisting lateral movement of said support member, said locating means including a plurality of spring arms supported by said support member between said sealing plug and said cap member for engaging the walls of the tubular member.

4,074,829
VENDING MACHINE HAVING EJECTOR ASSIST MEMBER

Gerry A. Lee, Des Moines, Iowa, assignor to Fawn Engineering Corporation, Des Moines, Iowa

Filed Oct. 4, 1976, Ser. No. 729,189
Int. Cl.[2] B65G 59/06
U.S. Cl. 221—238 13 Claims



1. A vending apparatus comprising:

a frame; a platform connected to said frame; means for holding a plurality of items to be dispensed, said holding means being connected to said frame and disposed above said platform; a discharge opening disposed rearwardly of said platform; a pull rod slidably disposed below said platform and having a first position and a second position; means pivotally attached to said pull rod for selectively ejecting one of said items from said holding means, said ejector means having a first pivotal position for passing under said items and a second pivotal position for engaging one of said items thereby causing the said one item to be moved from the holding means; the improvement comprising:

a base member attached to said platform;

an ejector assist member reciprocally attached to said base member and movable between a first position and a second position;

biasing means for biasing said ejector assist member to said first position thereof;

locking means for selectively holding said ejector assist member in said second position thereof;

means for moving said ejector assist member from the first to the second position thereof when said pull rod is moved from the first to the second position thereof;

means for releasing said locking means when said pull rod is moved from the second to the first position thereof; and

means attached to said ejector assist member for engaging and following said item being dispensed when said locking means is released and said ejector assist member is moving from the second to the first position thereof and for holding the rear end of the next item to be dispensed upwardly with respect to the front end thereof to prevent more than one item from being dispensed at one time.

4,074,830
COMPRESSED AIR SEED PLANTER

Charles E. Adams, Mill Creek; Harold E. Quackenbush, La Porte; Paul H. Harrer, La Porte; Le Roy Langford, La Porte, all of Ind., and Alvin L. Cleek, Wauwatosa, Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 23, 1974, Ser. No. 508,672
Int. Cl.[2] A01C 7/04
U.S. Cl. 221—266 1 Claim

1. An air planter unit comprising:

a housing having

a seed receiving cavity,

a first flat axial facing arcuate sealing surface,

a second flat axially facing sealing surface extending from one circumferential end of said first sealing surface radially inwardly, said sealing surfaces at least partially circumscribing said cavity,

a seed passageway connected at one end to said cavity and adapted at its other end for connection to a seed hopper,

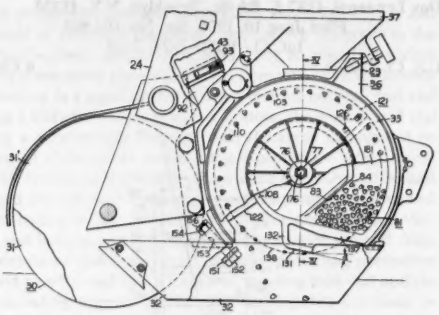
an air passageway connected at one end to said cavity and adapted at its other end for connection to a source of pressurized air, and

an open seed drop portion at its lower end,

a vertically disposed seed planting disc rotatably mounted on said planter unit on a horizontal transverse axis in substantially concentric relation to said first sealing surface and having

a substantially flat annular sealing surface on one axial side of said disc in sealing engagement with said sealing surfaces on said housing whereby said disc is disposed in enclosing relation to said cavity,

a plurality of circumferentially spaced seed receiving pockets formed in said one axial side, said pockets being



disposed on the radially inner side of said first sealing surface on said housing and said second sealing surface on said housing extending radially inwardly to a point at the radially inner side of said pockets, and

wall means defining a small axial opening through the bottom of each of said pockets permitting escape of air from said cavity, said pockets and openings being proportioned to hold seed in said pockets under influence of pressurized air in said cavity, said pockets being out of communication with said cavity as the rotating disc brings them to said seed drop portion of said housing whereby said seed in each pocket is free to fall to the soil by gravity as said disc is rotated to bring the pockets into said drop portion, and

a resilient sealing pad in sealing engagement with said disc disposed between the radially inner end of said second sealing surface and said first sealing surface near the other circumferential end of the latter.

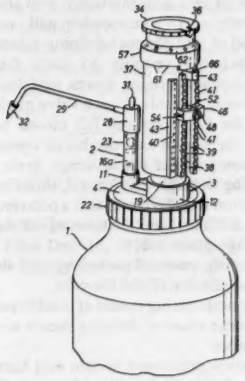
4,074,831
LIQUID METERING DEVICE WITH ADJUSTABLE STOPS

William John Roach, 12933 Lakeshore North, Auburn, Calif. 95603

Filed Feb. 12, 1976, Ser. No. 657,544
Int. Cl.[2] G01F 11/06
U.S. Cl. 222—43 13 Claims

1. Dispensing apparatus for releasable attachment to the mouth of a liquid reservoir comprising a housing defining an inlet aperture, an outlet aperture and a proportioning aperture, said apertures being in communication with one another within said housing, means for securing said housing to said reservoir so that said inlet aperture is directed into said reservoir mouth and said outlet and proportioning apertures are directed away from said reservoir mouth, a non-return inlet valve connected to said inlet aperture, a non-return delivery valve connected to said outlet aperture and syringe means in communication with

said proportioning aperture, wherein said syringe means comprise an open-ended stationary barrel connected to said housing over said proportioning aperture, a plunger displaceable in said barrel to draw liquid past said inlet valve through said inlet aperture and through said proportioning aperture into said barrel on a forward stroke and to discharge said liquid through said proportioning aperture and through said outlet aperture past said delivery valve on a return stroke, and con-



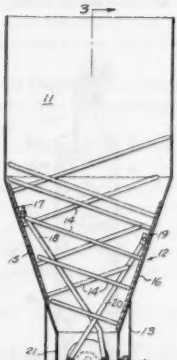
trol means for limiting displacement of said plunger, said control means comprising co-operating abutments associated with said plunger and barrel, wherein said abutments comprise two adjustable abutments, means for adjusting one of said adjustable abutments to change the length of stroke of the plunger in discrete steps for providing a coarse setting, and means for adjusting the other of said adjustable abutments to change the length of stroke of the plunger in discrete finer steps for providing a fine setting.

4,074,832

FOOD DISPENSER HAVING DOOR ACTUATED AGITATORS

John J. McCarthy, 10540 Dolecetto Drive, Rancho Cordova, Calif. 95670

Filed Sept. 14, 1976, Ser. No. 723,177
Int. Cl.[2] B67D *3/00*; G01F *13/00*
U.S. Cl. 222—245 **7 Claims**



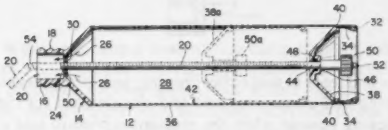
1. A dry food dispenser which assures that the food has a substantially uniform consistancy comprising, a storage hopper, a mixer section connected to said storage hopper, and a discharge chamber remote from said storage hopper but connected to said mixer section, said discharge chamber including a swingable door remote from said mixing section which allows the food to be dispensed when opened, said swingable door being pivotally mounted on said discharge chamber through axles, said axles being further connected to a pair of discs disposed within said discharge chamber so that when said swingable door is rotated, said discs also rotate, a pair of shafts interconnecting said discs disposed diametrically opposite to each other so that when said discs rotate said shafts translate in an opposite vertical sence, and means disposed on said shafts to agitate the dry food within said mixer section to assure that the dry food will have a uniform consistancy and is not clotted.

4,074,833

DISPENSING CONTAINER

Joseph H. Otto, Sr., 3934 Alabama Ave. S., St. Louis Park, Minn. 55416

Filed Aug. 24, 1976, Ser. No. 717,160
Int. Cl.[2] G01F *11/00*
U.S. Cl. 222—390 **4 Claims**



1. A dispensing container comprising a hollow cylindrical body portion having a first and second end, a closable dispensing opening disposed at the first end of the cylindrical body portion, a cylindrical plate disposed within the cylindrical body portion having marginal edges disposed in slidable touching engagement with the interior surface of the cylindrical body portion, the inner edges of the cylindrical body portion at the second end disposed and folded inwardly of the cylindrical body portion and fixedly secured to the marginal edges of the plate, a rod having a threaded portion threadedly engaging the first end of the cylindrical body portion, sealing means sealing an unthreaded portion of the rod passing through an opening in the plate, portions of the rod being exposed upon passing through the dispensing opening when the plate is urged towards the dispensing opening, and a knob fixedly secured to the end of the rod externally of the cylindrical plate.

4,074,834

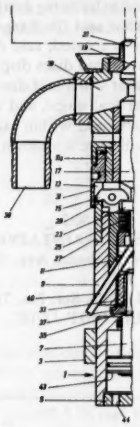
CASTING HEAD WITH TOGGLE LEVER ACTUATED VALVE

Alois Joseph Suter, Im Holeeletten 29, Basel, Switzerland

Filed Sept. 29, 1976, Ser. No. 727,847
Claims priority, application Switzerland, Sept. 29, 1975, 12579/75
Int. Cl.[2] B29F *1/03*
U.S. Cl. 222—504 **9 Claims**

1. A casting head for cooperation with a mold in which hardenable synthetic resins can be cast under a high temperature, the mold having an inlet for the resins, the head comprising: a stationary part (**1**) and a part (**2**) movable with respect to said stationary part; at least one hydraulic cylinder (**4, 5, 6**) in said stationary part to change the relative position of a portion of said movable part with respect to said stationary part, between a closed rest position and a casting position, said cylinder having a double-acting piston rod (**7**) connected with said movable part; a housing in said movable part with bottom (**9**) and top (**10**) parts; said top housing part having therein an opening passage (**19**) for the resins, that leads toward the inlet of the mold, and an outlet opening (**21**) for the resins, which latter opening can be brought into close contact with the inlet of the mold; at least one toggle lever (**14, 15**) movably jour-

naled within and pivotable in said bottom housing part; a lengthwise movable closure rod (**17**) in said movable part; a closure head (**18**) carried by the outer end of said closure rod, acting on said opening passage which is open in the casting



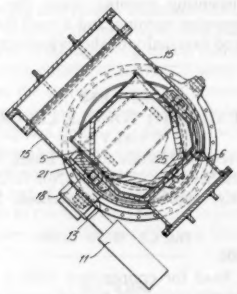
position and leads to said outlet opening; and spring means (**25**) for biasing said closure rod and said closure head for closing said opening passage when the pressure applied to said cylinder has been released.

4,074,835

FURNACE CHARGER WITH DISCHARGE CHANNEL HAVING APPROXIMATE OVAL CROSS-SECTION

Edouard Legille, Luxembourg, and Rene N. Mahr, Howald-Hesperange, both of Luxembourg, assignors to S.A. des Anciens Etablissements Paul Wurth, Luxembourg, Luxembourg

Filed Mar. 6, 1973, Ser. No. 339,296
Claims priority, application Luxembourg, Mar. 6, 1972, 64909
Int. Cl.[2] **F27B** *11/12;* **B65D** *87/28*
U.S. Cl. 222—558 **9 Claims**



1. In apparatus for use in the charging of a furnace, the charging apparatus including a storage hopper from which materials will be released for delivery into the furnace, the improvement comprising:

discharge channel defining means, said channel defining means including a plurality of straight wall portions, said straight wall portions cooperating to form a tubular element having a longitudinal axis and being open at its opposite ends, said tubular element having a cross-sectional shape when viewed along said longitudinal axis which approximates an oval, said approximately oval cross-section having a major axis and a transverse minor axis, said channel defining means being connected at a first upstream end to the storage hopper;

a movable throttle valve member juxtapositioned to the second downstream end of said channel defining means, said valve member having a leading edge portion and being supported for movement of said leading edge portion along a path transverse to a plane including the longitudinal axis of said tubular element and extending through the major axis of said approximately oval shaped tubular element whereby said valve member will cooperate with the second end of said channel defining means to form an adjustable discharge opening to vary the flow rate through said channel defining means, said discharge channel flow rate being variable about a valve member position intermediate the full open and full closed positions and directly with the size of said discharge opening and as a function of composition and average grain size of the material flowing through the channel, there being a different valve position required to obtain a preselected average flow rate for different combinations of material composition and average grain size;

means for delivering material passed by said throttle valve member to the interior of the furnace;

substantially hermetic casing means at least in part surrounding said discharge channel defining means and said throttle valve member;

sealing valve means positioned within said hermetic casing means intermediate said throttle valve and said means for delivering material into the furnace, said sealing valve means cooperating with said casing means to permit said throttle valve member and the intermediate storage hopper to be isolated from the conditions existing within the furnace;

actuator means; and

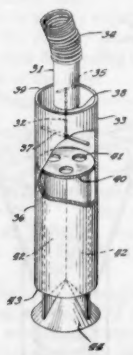
means coupling said actuator means to said throttle valve member to cause the repositioning of said valve member leading edge portion to vary the discharge opening defined by the second end of said channel defining means tubular element and said valve member.

4,074,836

APPARATUS FOR DISTRIBUTING SOLID PARTICLES INTO A VERTICAL VESSEL

Karl A. Muller, Jr., Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sept. 22, 1976, Ser. No. 725,518
Int. Cl.[2] **B67D** *3/00*
U.S. Cl. 222—564 **4 Claims**



1. In an improved apparatus for distributing solid particles into a vertical vessel when said solid particles are being loaded into said vessel, which apparatus comprises a distributing means for distributing said solid particles into said vertical vessel, said distributing means having an inlet for said solid

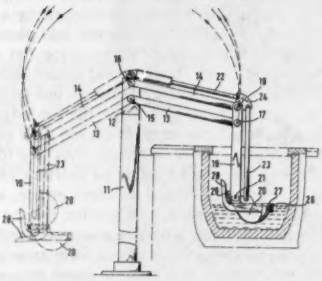
particles at its top, the improvement which comprises a particle entry duct having an inlet end at its top and an outlet end at its bottom and a flexible connecting means for connecting said particle entry duct to said distributing means, the top of said connecting means being attached to said particle entry duct at a point along the axis of said particle entry duct and the bottom of said connecting means being attached to the distributing means at a point where the center of gravity of the distributing means is located in a manner such that the periphery of the bottom of said particle entry duct is positioned within the periphery of the top of said distributing means, the length of said connecting means being such that the bottom of said particle entry duct is on the same level or below the top of said distributing means.

4,074,837

AUTOMATICALLY OPERATING CASTING LADLE APPARATUS

Werner Engel, Ringstrasse 13, 3502 Vellmar 2, Germany

Filed Dec. 15, 1976, Ser. No. 750,930
Claims priority, application Germany, Dec. 15, 1975, 2556447
Int. Cl.[2] B22D *39/00*
U.S. Cl. 222—629 **10 Claims**



1. In an automatically operating casting ladle apparatus for the delivery of a measured quantity of molten metal to a die-casting machine, mold or the like, and comprising:

a fixed frame,

at least one swivel arm pivotably mounted at one end to said fixed frame,

a supporting arm pivotably mounted at one end to the other end of said at least one swivel arm,

a casting ladle mounted to the other end of said supporting arm,

auxiliary means for keeping said casting ladle in a constant vertical position during swiveling movements of the swivel arm, and

a control linkage mechanism for tilting the ladle,

the improvement wherein:

said at least one swivel arm comprises two parallel, equal length lever arms, each lever arm being pivotably connected at one end to said fixed frame and extending in spaced parallel position with respect to each other and each being pivoted at their other end to said supporting arm,

a drive cylinder disposed in the vicinity of said fixed frame, and

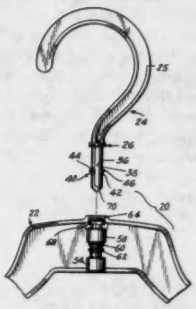
said control linkage mechanism comprises a pair of control members, one of said control members lying parallel to said lever arms, being operatively connected at one end to a drive cylinder and being operatively connected at its opposite end to one end of the second control member and extending parallel to the supporting arm for said ladle and being operatively coupled at its end remote from said first control member, to said casting ladle.

4,074,838

GARMENT HANGER CONSTRUCTION

William Blasnik, Demarest, N.J., and David Halpert, Melville, N.Y., assignors to Lerner Manufacturing, Inc., Melville, N.Y.

Filed Mar. 11, 1977, Ser. No. 777,238
Int. Cl.[2] A47J *51/098*
U.S. Cl. 223—85 **12 Claims**



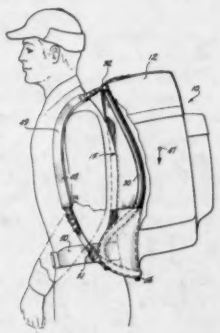
1. A garment hanger construction comprising a hook member, said hook member having an elongated shaft supporting a first operative locking means and a first operative swivel means, and a hanger body including receiving means for receiving said shaft, said receiving means including second operative locking means constructed and arranged to cooperatively define a first locked position with said first operative locking means disposed on said shaft and further including second operative swivel means for cooperatively defining a second swivel position with said first operative swivel means disposed on said shaft for permitting said hook member to freely rotate at said second swivel position and for preventing said hook member from being longitudinally displaced as it is freely rotated at said second swivel position, said shaft being coordinately displaceable in said receiving means along the lengthwise extent thereof between said first locked position and said second swivel position.

4,074,839

INTERNAL FRAME BACKPACK

Thomas E. Wood, and Calvin T. Wood, both of 3863 42nd NE., Seattle, Wash. 98105

Filed May 10, 1976, Ser. No. 684,566
Int. Cl.[2] A45F *3/08*
U.S. Cl. 224—8 R **9 Claims**



1. An internal frame backpack including:

a sack having a compartment for holding goods to be carried;

an envelope of substantially fixed length disposed on the front of said sack, the peripheral edges thereof being closed, said envelope including a tensioned front wall positionable against the back of a wearer and a second rear wall spaced rearward of and fixedly joined along its entire peripheral edge to said first front wall;

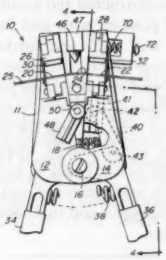
tubular internal frame means positioned within said closed envelope under compression, said internal frame means being longitudinally resilient and including a curved portion adapted to contact the rear wall of said envelope and being formed between spaced end portions, said end portions making contact, substantially along their entire length with the longitudinally opposed closed peripheral edges of said envelope whereby said internal frame means cooperates with said peripheral edges to tension the front wall of said envelope to maintain said front wall spaced forward of said rear wall and tending to bias said front wall against deflection by contact with the back of the wearer.

4,074,840

HAND-HELD TOOL FOR OPTICAL FIBER WAVEGUIDE END PREPARATION

John E. Fulenwider, Concord; Carl Belmonte, Somerville, and Mark L. Dakss, Sudbury, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 18, 1977, Ser. No. 778,885
Int. Cl.[2] B26F *3/00*
U.S. Cl. 225—96.5 **4 Claims**



1. A hand-held tool for the preparation of optical fiber waveguide ends comprising:

a pair of jaw members coupled for separating rotational movement about a pivot axis;

means for biasing the jaw members in a comparatively unseparated position;

first and second fiber-supporting surfaces respectively located on a different one of the jaw members for receiving and supporting an optical fiber waveguide generally circumferentially about the pivot axis;

a third fiber-supporting surface interjacent the first and second surfaces and generally aligned therewith;

a pair of spaced-apart handle members adapted for movement by a squeezing human hand;

fiber clamping means responsive to the movement of the handle members for exerting a waveguide-securing force against the fiber supporting surfaces and for exerting a jaw member-separating force in response to further movement of the handle members, thereby inducing a tensile stress along the waveguide; and

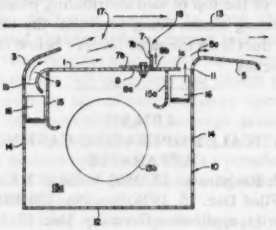
a descendable cutting blade manually releasable from a position above the third fiber-supporting surface for contacting the portion of the fiber waveguide thereon to produce a microcrack in the waveguide periphery, whereby the induced tensile stress in the waveguide coupled with the circumferential support thereof causes a diametric propagation of the crack across the waveguide to produce an appropriately prepared fiber end.

4,074,841

METHOD AND APPARATUS FOR FLOATATION CONVEYANCE OF STRIP MATERIALS

Carl Kramer, Am Chorusberg 8, Aachen; Heinrich Stein, Roermonder Str. 138b, Aachen-Laurensberg, and Hans Joachim Gerhardt, Ruhrstr. 12, Loevenich, all of Germany

Filed Dec. 9, 1976, Ser. No. 749,109
Claims priority, application Germany, Dec. 15, 1975, 2556442
Int. Cl.[2] B65H *17/32*
U.S. Cl. 226—97 **3 Claims**



1. In apparatus for jet floatation conveyance of strip materials, the improvement in floatation means comprising: a plenum adapted to receive a pressurized gas therein; said plenum having a pair of spaced apart side members; a top flat member spaced intermediate said side members and spaced apart therefrom to define a pair of nozzles therebetween; one edge of said top member being curved downwardly; the top edge of the side member adjacent said top member curved edge extending upwardly and curved inwardly to project over said top member at an acute angle thereto to define an aperture parallel to and greater than the width of the adjacent nozzle; a spoiler exterior of said plenum between said nozzles; the top edge of the other of said side members being curved outwardly away from said top plate and then extending to form an acute angle with said other side portion, and a pair of plates secured to the underside of said top member and projecting downwardly therefrom and parallel to said nozzles; the bottom edges of said plates being curved inwardly.

4,074,842

DEVICE FOR INSERTING NAIL-LIKE FASTENERS AT DIFFICULTLY ACCESSIBLE POINTS

Jean Ollivier, 89 avenue des Beaumes, and Marc Combette, 116 rue des Moulins, both of Valence, France (26000)

Filed Dec. 10, 1976, Ser. No. 749,580
Claims priority, application France, Dec. 9, 1975, 75 37630
Int. Cl.[2] B25C *1/14*
U.S. Cl. 227—8 **5 Claims**

1. A power-actuated fastener-driving tool comprising:

(a) a barrel assembly having a muzzle end adapted to receive a fastener to be driven into a supporting surface;

(b) a casing member connected to said barrel assembly;

(c) firing pin means mounted in said casing member for percussive firing of a power charge chambered in the tool, said firing pin means being movable between a cocked position and a fired position;

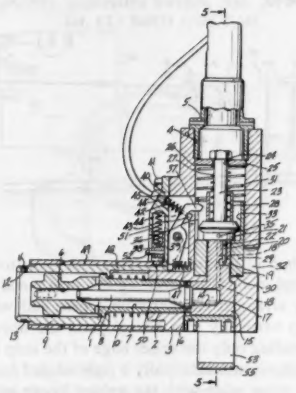
(d) first spring means engaging said firing pin means to bias the latter toward said fired position;

(e) an elongated extension member connected to said casing member and extending in a direction substantially perpendicular to the axis of said barrel member to facilitate positioning of the tool in difficultly accessible places;

(f) an operating member mounted on said casing member and projecting externally therefrom in a direction diametrically opposite from said extension member, said operating member being reciprocably movable, with respect to said casing member, through a cocking stroke and return upon successive application and release of pressure to a free end of said operating member;

(g) second spring means operably connected to said operating member for biasing the latter through said return stroke;

(h) said operating member being operably connected to said firing pin means for causing movement of the latter to said cocked position upon movement of said operating member through said cocking stroke;



(i) first sear means releasably engaging said firing pin means to hold the latter in said cocked position; and

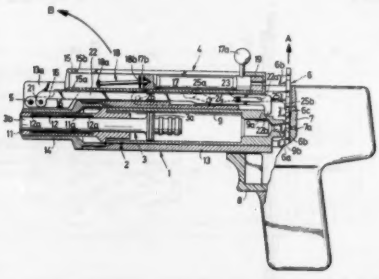
(j) actuating means connected to said first sear means and mounted on said extension member for manual operation thereof, whereupon said actuating means is operable to disengage said first sear means from said firing pin means.

4,074,843

FASTENING ELEMENT FEEDING DEVICE FOR AN EXPLOSIVE POWDER DRIVEN SETTING GUN

Helmut Oesterle, Nofels, Austria, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Dec. 20, 1976, Ser. No. 752,096
Claims priority, application Germany, Dec. 22, 1975, 2557847
Int. Cl.[2] B25C 1/14
U.S. Cl. 227—8 **14 Claims**



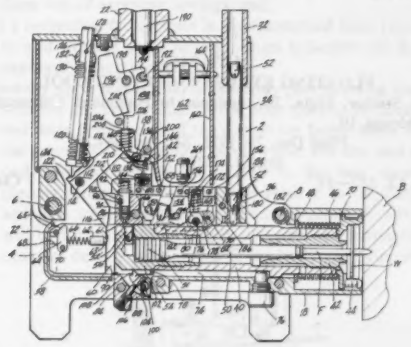
1. An explosive powder driven setting gun for driving fastening elements having a pointed end and an oppositely directed head end, such as nails and the like, into a hard receiving material, including a gun housing, an axially extending barrel mounted in said housing, said barrel having a muzzle end from which the fastening elements are driven into the receiving material and a rearward end, and a feeding device for supplying fastening elements into the barrel, said feeding device being pivotally mounted on said housing, wherein the improvement comprises that said feeding device is pivotally displaceable between a first position for inserting fastening elements into the feeding device and a second position for inserting fastening elements from the feeding device through the muzzle end of the barrel into the barrel, said feeding device including a tubular member having an open end through which fastening elements can be inserted into the tubular member and displaced from the tubular member, and an ejector in said tubular member for displacing a fastening element from the tubular member into the barrel.

4,074,844

GRAVITY FEED HOT TOP TOOL

Elmer Raleigh Hodil, Jr., Branford, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Jan. 17, 1977, Ser. No. 760,059
Int. Cl.[2] B25C 1/14
U.S. Cl. 227—8 **18 Claims**



1. A powder-actuated tool comprising:

a. a housing;

b. a barrel assembly mounted in said housing for reciprocal sliding movement with respect to said housing from a rearwardmost battery position to a forward loading position and return;

c. means forming a firing chamber in said barrel assembly, said firing chamber having a substantially vertical axis;

d. means carried by said housing forming a substantially vertical passage adapted to receive and hold a stack of a plurality of cartridges disposed end to end in said passage, said passage being positioned forward of said firing chamber when said barrel assembly is in its battery position; and

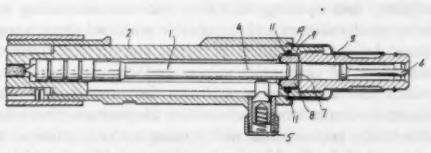
e. stop means on said housing for stopping forward movement of said barrel assembly to align said firing chamber and said passage to enable a cartridge to drop by gravity from said gravity into said firing chamber when said barrel assembly is in said loading position.

4,074,845

DEVICE FOR MAINTAINING IN POSITION THE PISTON OF A FASTENER TOOL

Marc Combette, 116 Rue des Moulins, and Jean Ollivier, 89 Ave. des Beaumes, both of Valence (Drome), France

Filed Sept. 16, 1976, Ser. No. 723,846
Claims priority, application France, Sept. 16, 1975, 75 28401
Int. Cl.[2] B25C 1/18
U.S. Cl. 227—10 **5 Claims**



1. A device for releasably maintaining the position of a piston in a power-actuated fastener tool, said device comprising means forming a ring in a barrel of the tool, said ring

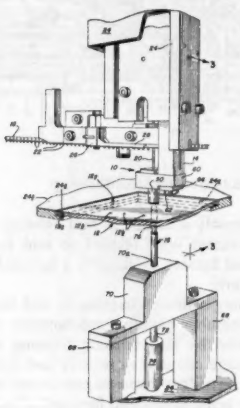
having a bore through which a forward end of said piston continuously extends, the axis of said bore being off-center with respect to the axis of said barrel, and said piston and said barrel being substantially coaxial, and resilient means sandwiched between an outer surface on said ring and an inner wall of said barrel, said resilient means being compressed by reason of said piston extending through said ring bore to cause said ring to exert a frictional retaining force on said piston.

4,074,846

FLOATING EYELET INSERTING TOOL

Alto Stoiber, Elgin, Ill., assignor to Hammond Corporation, Chicago, Ill.

Filed Dec. 24, 1975, Ser. No. 644,297
Int. Cl.[2] B21J *15/10*
U.S. Cl. 227—51 **7 Claims**



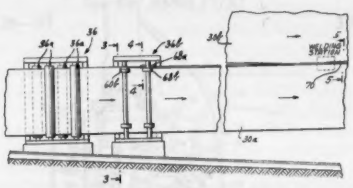
1. Apparatus for inserting and staking rivets in a flexible sheet having at least one rivet receiving opening comprising: a chassis; reciprocable punch means movable relative to said chassis for inserting one of said rivets into said opening in said flexible sheet; anvil means reciprocably mounted on said chassis opposite said punch means and in axial alignment therewith for staking said inserted rivet; means mounted on said chassis for supporting said sheet between said punch means and said anvil means; first holding means, suspended upon said punch means and operable to move bidirectionally relative thereto, for supporting said sheet in the area adjacent said opening; resilient members connected to said punch means and said first holding means for regulating bidirectional movement of said first holding means relative to said punch means; second holding means yieldably extending from and coaxially mounted upon said anvil means for supporting said sheet in the area adjacent said opening; said first and second holding means being axially aligned and engageable with said sheet; a support plane defined as a plane perpendicular to the direction of movement of said punch means and disposed between said punch and anvil means; and said first and second holding means accommodating variations in the position of said flexible sheet in the area adjacent said opening such as variations due to warpage of the flexible sheet relative to said support plane by clamping about said rivet receiving opening in said sheet during insertion and staking of said rivet.

4,074,847

WELDED STORAGE TANK CONSTRUCTION INCLUDING A STRUCTURAL FIN

Myron L. McFatter, League City, Tex., assignor to Anchortank, Inc., Seabrook, Tex.

Filed Sept. 20, 1976, Ser. No. 725,114
Int. Cl.[2] B23K *31/02*
U.S. Cl. 228—145 **4 Claims**



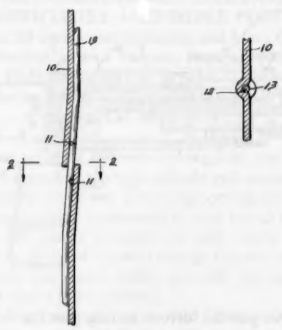
1. In a method of producing a large diameter storage tank from strip metal, comprising feeding the strip metal to a support assembly arranged circularly on a base and which supports the strip vertically in a helical path, the improvement comprising bending only the upper edge of the strip fed to the support assembly into substantially a right-angled bend, aligning said bent upper edge with the unbent lower edge of the helical turn immediately thereabove, and welding together said two aligned edges.

4,074,848

METHOD OF SEALING

Edward F. Groh, Naperville, Ill., and Dale A. Cassidy, Valapariso, Ind., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 27, 1977, Ser. No. 763,167
Int. Cl.[2] B23K *1/00*
U.S. Cl. 228—173 C **2 Claims**

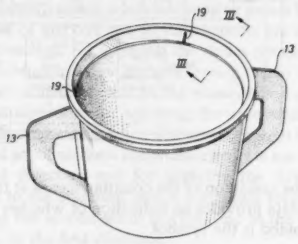


1. A method of penetrating thin sheet metal with a thermocouple lead and sealing the thermocouple lead into the sheet metal comprising drawing complementary longitudinally angled, laterally rounded grooves terminating at their base ends in a common plane in both sides of the thin material with shearing occuring in the plane of the base ends to form a round opening substantially perpendicular to the plane of the sheet metal, passing a thermocouple lead through this opening and sealing the opening with silver solder which simultaneously bonds the thermocouple lead to the sheet metal.

4,074,849
BLANK FOR FORMING A RECEPTACLE HAVING OPPOSITE HANDLES

Sven Davidsson; Nils Bertil Christensson, and Per Hugo Axelsson, all of Lund, Sweden, assignors to AB Akerlund & Rausing, Lund, Sweden

Filed Feb. 11, 1977, Ser. No. 767,818
Claims priority, application Sweden, Apr. 21, 1976, 7604564
Int. Cl.[2] B65D *3/06, 5/46*
U.S. Cl. 229—1.5 B 9 Claims

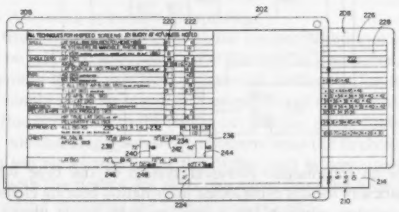


1. A blank for forming a receptacle comprising:
a substantially circular bottom member,
a pair of side members each connected to portions of said bottom member, such that when said blank is formed into a receptacle, said bottom member forms the bottom wall of said receptacle, and said side members cooperate to form the sidewall of said receptacle, and
each of said side members including on only one end thereof one extension member, said extension members being formed on opposite ends of said respective side members such that they cooperate to form diametrically opposed handle means on the sidewall of said formed receptacle.

4,074,850
X-RAY COMPUTER

Brice L. Kratzer, 4203 E. Jackson, Elkhart, Ind. 46514

Filed Feb. 12, 1974, Ser. No. 441,870
Int. Cl.[2] G06G *1/00*
U.S. Cl. 235—89 R 9 Claims



1. A manually operable computer for determining a set of exposure settings of an X-ray machine, comprising:
a base member, a first scale member, a second scale member and means for supporting said members for movement relative to each other;
said base member having thereon
(a) a body chart including identifying indicia for at least one body part of a subject to be X-rayed, said indicia including indexing means, and
(b) a correction factor index in predetermined fixed relation to said indexing means;
said first scale member having thereon
(a) a thickness chart including at least one thickness scale having values representing a plurality of thicknesses of said one body part, each of said values being registrable with said indexing means and
(b) a current and time chart in predetermined fixed relation to said thickness chart including at least one current and time scale having values representing current and time exposure settings; and
said second scale member having thereon,
(a) a voltage scale in parallel relation with said current and time scale having values representing voltage exposure settings, each of said current and time scale values and said voltage scale values being disposed on said first and second members, respectively, such that for any setting of said first and second members said current and time values and said voltage values will be in juxtaposed relation to form sets of exposure settings, and
(b) a correction factor scale in predetermined fixed relation to said voltage scale having values indicative of X-ray exposure correction factors
whereby upon registration of the body part indexing means with the thickness value of the body part to be X-rayed and upon registration of the correction factor index with the appropriate correction factor value, the first and second members will be set relative to the base member thereby setting the voltage scale relative to the current and time scale whereupon the sets of exposure settings will be formed each of which will produce substantially constant density radiographs of the body part X-rayed.

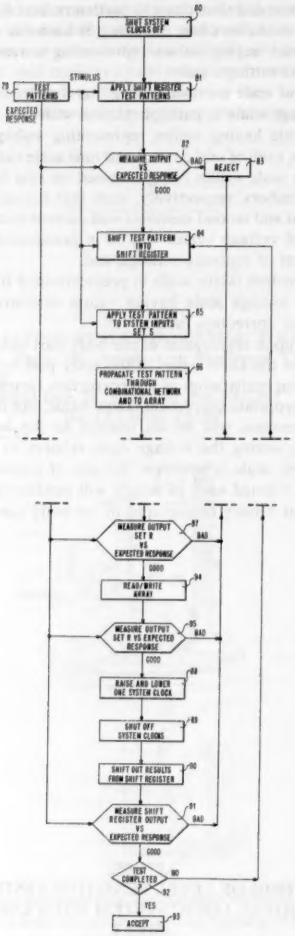
4,074,851
METHOD OF LEVEL SENSITIVE TESTING A FUNCTIONAL LOGIC SYSTEM WITH EMBEDDED ARRAY

Edward Baxter Eichelberger, Purdy Station, N.Y.; Eugen Igor Muehldorf, Potomac, Md.; Ronald Gene Walther, Vestel, N.Y., and Thomas Walter Williams, Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1976, Ser. No. 701,054
Int. Cl.[2] G06F *11/00*
U.S. Cl. 235—302 26 Claims

1. A method of level sensitive testing a single sided delay dependent embedded array logic unit, said unit including combinational network circuit means having primary input terminals and primary output terminals, said combinational network circuit means including at least a first combinational network and a second combinational network, means including array circuit means interconnecting said first and second combinational networks and sequential circuit means interconnected with said combinational circuit means said sequential circuit means having access for scanning data into said sequential circuit means independent of said primary input terminals and primary output terminals, said method including the steps of:
(a) scanning in a test pattern, via said scanning access into said sequential circuit means;
(b) applying the same test pattern, via said primary input terminals, to the combinational network circuit means to

provide a primary output at said primary output terminals; and



(c) comparing said primary output with a known expected response for an indication as to the merit or lack of merit of the unit.

4,074,852

SYMBOL DECODING METHOD AND MEANS

Robert D. Wescott, and John B. Christie, both of Ithaca, N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 6, 1976, Ser. No. 748,252
Int. Cl.[2] G06K *7/10;* **G08C** *9/06*
U.S. Cl. 235—463 **32 Claims**

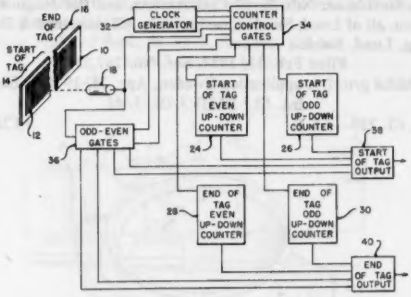
1. Symbol decoding means comprising

scanning means for scanning a surface upon which coded data has been placed and generating a signal representative of the information scanned;

means for generating a plurality of clock signals of different frequencies with the relationship of the frequencies based upon the relationship of a plurality of components of a code symbol to be identified;

counting means; and

means for applying the various frequencies to the counting means in accordance with the relationship of the different components of a symbol being scanned;



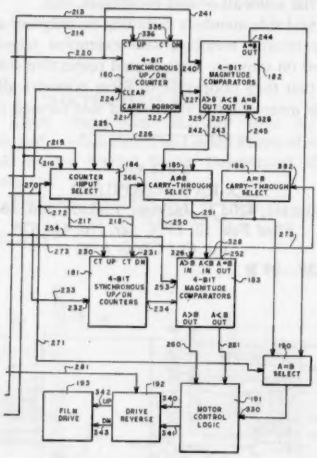
whereby the condition of the counting means at the end of a scan of data provides an indication of whether or not the data scanned is the symbol.

4,074,853

DUAL FUNCTION PROBE

John R. Flint, Barrington, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Nov. 3, 1976, Ser. No. 738,421
Int. Cl.[2] G06K *13/26, 19/06;* **G03B** *23/12*
U.S. Cl. 235—477 **9 Claims**



1. In an information retrieval system of the type which automatically locates preselected information bearing elements for inspection wherein the system includes drive means for driving the elements in first and second directions, wherein the information bearing elements are consecutively numbered for identification and comprise a first set of elements having increasing identification number when driven in the first direction and a second set of elements having increasing identification numbers when driven in the second direction, wherein each element is associated with a corresponding identifiable marker with the markers associated with the first set of elements comprising a first set of markers and the markers associated with the second set of elements being spaced from the first set of markers and comprising a second set of markers, and wherein the system includes a counting means for counting the elements for maintaining the location of the elements as the elements are driven, the improvement of a marker sensing system for sensing the first and second sets of markers and for

properly controlling the drive means and the counting means comprising:

a marker sensor for sensing the first and second sets of markers and for providing up counting pulses and down counting pulses as the elements are driven;

a marker sensor detector for detecting which set of markers is being sensed; and

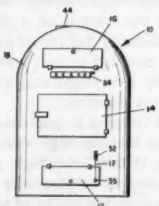
first interface means coupled to said detector and selectively coupling said marker sensor to the counting means responsive to said detector for applying the up counting pulses to the counting means when said sensing means is sensing the first set of markers and as the elements are driven in the first direction, for applying the down counting pulses to the counting means when said sensing means is sensing the first set of markers and as the elements are driven in the second direction, for applying the up counting pulses to the counting means when said sensing means is sensing the second set of markers and as the elements are driven in the second direction and for applying the down counting pulses to the counting means when said sensing means is sensing the second set of markers and as the elements are driven in the first direction.

4,074,854

HEATING APPARATUS

Egbert B. Kamper, Rudyard, Mich., assignor to Kamper's Woodfire Co., Inc., Rudyard, Mich.

Filed June 28, 1976, Ser. No. 700,687
Int. Cl.[2] F24D *5/04*
U.S. Cl. 236—11 **8 Claims**



1. A heating apparatus comprising:

a firebox having at least a partial nonporous bottom section on which combustible materials may be positioned,

venting means in a front portion of the firebox for feeding combustion air into the front portion of the firebox;

a flue connected to the rear upper portion of the firebox for withdrawing gases of combustion from the firebox;

an ash pit located under the firebox and in communication with the firebox for receiving ashes from the firebox;

a casing enclosing the firebox and ash pit;

the flue extending to a front portion of the casing and back rearwardly to a rear portion of the casing where it exits therefrom;

a door means on a front portion of the casing for providing access to the interior of the flue;

a nonporous sheet pivotably mounted within the firebox above the door so that the sheet hangs in a vertical manner and partially blocks access to the front side of the firebox when in the vertical position;

intake means for supplying air into the casing to be heated;

withdrawing means for withdrawing heated air from the casing; and

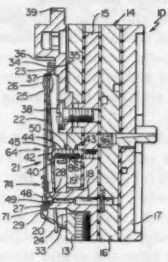
the casing being of sufficient size to permit passage of air from the intake means and to circulate around the firebox and flue and pass out through the withdrawing means.

4,074,855

ADJUSTABLE BIMETAL CONSTRUCTION AND METHOD OF MAKING THE SAME

Harold G. Brakebill, Richmond, Va.; Jay L. Lewis, and Clarence M. Asbill, III, both of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed May 26, 1976, Ser. No. 690,070
Int. Cl.[2] G01K *5/62*
U.S. Cl. 236—87 **15 Claims**



1. An adjustable bimetal construction adapted to provide an adjustable throttling range and comprising a frame means, a first bimetal member having opposed ends one of which is operatively interconnected to said frame means while the other end is movable relative to said frame means, a second bimetal member having opposed ends one of which is operatively interconnected to said frame means while the other end thereof is movable relative to said frame means, and adjustable means operatively interconnecting said other ends of said bimetal members together to provide a combined bimetal action at said other ends, said first bimetal member being thicker than said second bimetal member, said first bimetal member being substantially U-shaped with the yoke portion thereof defining said one end thereof and the free ends of the legs thereof defining said other end thereof, said second bimetal member being an elongated length with said one end thereof being secured to said yoke portion and with said other end thereof extending beyond said legs while the body portion of said second bimetal member is intermediate said legs.

4,074,856

GREENHOUSE WATERING APPARATUS

David Williams; Brian A. Lentz, and Harold E. Le Veque, all of Salinas, Calif., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 5, 1976, Ser. No. 712,075
Int. Cl.[2] B05B *3/18*
U.S. Cl. 239—1 **39 Claims**

1. A greenhouse watering apparatus, including in combination:

a horizontally disposed support member,

suspension means secured to an upper end portion only of said support member for suspending it from above, as from the roof of a greenhouse,

a carriage having yoke means at its upper end with trolley wheels resting on and rolling on two opposite upper surface portions of said support member in such a way that said suspension means does not interfere with back-and-forth movement of said carriage,

drive means supported by said carriage for driving said carriage to achieve back-and-forth movement of said carriage along said support member,

a hose reel rotatably mounted on said carriage and having a central pipe with an inlet fitting,

a hose having one end secured to said inlet fitting and so mounted on said reel as to be maximally reeled when said carriage is located centrally between the ends of said support member and minimally reeled when said carriage is at either said end, said hose having a second, input end,

a slip clutch,

power transmission means connecting said reel to said drive means through said slip clutch, to keep a substantially constant tension on said hose so that said reel is driven to reel said hose when the carriage moves from either end toward the center and so that said hose unreels in a straight line under tension while the clutch slips as the carriage moves from the center toward either end,

a pair of boom-conduit means supported by said carriage, one on each side of said reel in a plane perpendicular to said support member, each boom-conduit means having a liquid conduit connected to said reel's central pipe through a rotating coupling means, and

a series of spray nozzles for each said liquid conduit.

4,074,857

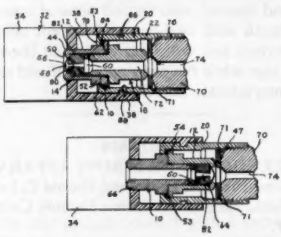
REVERSIBLE SPRAY TIP

Oliver J. Calder, 1205 E. Madison, Orange, Calif. 92667

Continuation of Ser. No. 622,633, Oct. 15, 1975, abandoned. This application Feb. 4, 1977, Ser. No. 765,809

Int. Cl.[2] B05B *15/02, 15/04*

U.S. Cl. 239—119 **5 Claims**



1. A spray tip assembly for reversible mounting in a spray gun that comprises:

(1) a cylindrical barrel housing having a forward end bearing at least one chordal flat, first and second outer rims of successively greater diameters at its opposite end to provide a large diameter rear face, and a bevelled aperture in its forward end opening to a larger diameter axial counterbore;

(2) a spray tip member received in said counterbore with its discharge end having a transverse spray discharge slot projecting through said aperture and aligned to said chordal flat;

(3) a cylindrical plug member having a first end of the diameter of said counterbore and received in a press fit therein, an outer medial rim of a diameter and width of said first rim, and an opposite end of a length equal to said forward end of said barrel housing; and

(4) an annular sealing member; said sealing member received in said counterbore and compressed between the received end of said plug member and the rear face of said spray tip member with the medial rim of said plug member butted against the rear face of said barrel housing.

4,074,858

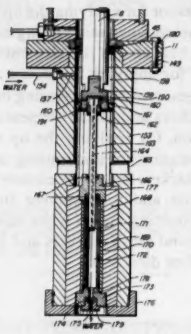
HIGH PRESSURE PULSED WATER JET APPARATUS AND PROCESS

David J. Burns, Waterloo; Udo H. Mohaupt, Cambridge, both of Canada, and Gene G. Yie, Chicago, Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Nov. 1, 1976, Ser. No. 737,716

Int. Cl.[2] B05B *1/08*

U.S. Cl. 239—172 **12 Claims**



1. A high pressure pulsed water jet apparatus operable in a vertical, horizontal or angled position comprising:

a cylindrical high pressure chamber having a nozzle in communication therewith at one end and a substantially watertight plug at the other end;

a cylindrical low pressure chamber having one end adjacent said other end of said high pressure chamber and the other end of said low pressure chamber adapted for receiving in substantially watertight relation one end of a power piston rod providing the output of a thrust generator means having a substantially flat thrust pattern;

a coupler piston coupled to said power piston rod adapted for substantially watertight reciprocal movement within said low pressure chamber;

a cylindrical ram coupled to said coupler piston and having a liquid passage therethrough along its long axis adapted to reciprocate within said high pressure chamber and through said plug in substantially watertight relation, a check valve preventing intake of water to said passage at one end maintained within said high pressure chamber, the other end of said liquid passage in communication with the volume between said coupler piston and said other end of said low pressure chamber; and

pressure means for maintaining liquid in said other end of said low pressure chamber.

4,074,859

DEFORMABLE PLUG FOR AN AIRCRAFT ENGINE EXHAUST NOZZLE

Richard M. Lowman, Jr., Hartsville, S.C., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

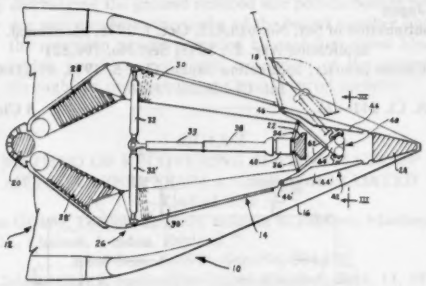
Filed Nov. 10, 1976, Ser. No. 740,517

Int. Cl.[2] B64C *15/00*

U.S. Cl. 239—265.33 **6 Claims**

1. In an engine exhaust nozzle system having an exhaust passageway made up of a pair of exhaust passageway fairing extensions, the improvement therein comprising a deformable plug fixedly positioned within the central portion of said exhaust passageway, said plug having a forward fairing and a rearward fairing, said forward fairing comprising a plurality of panels adjustably mounted with respect to said exhaust passageway, said rearward fairing comprising a pair of flaps pivotally secured to said forward fairing, means operatively connected to said forward fairing for moving said panels to a

plurality of positions, means operatively connected to said rearward fairing for moving said flaps to a plurality of positions, said rearward fairing movement means being in the form of dual ball rod and clevis rod assemblies, each of said assemblies being connected to respective flaps of said rearward fairing and a gear drive assembly operatively connected to



each of said ball rod and clevis rod assemblies for moving said assemblies in a scissor-like fashion thereby extending or retracting said flaps, and said forward fairing moving means and said rearward fairing moving means being interconnected whereby upon movement of said forward fairing simultaneous movement of said rearward fairing movement means takes place.

4,074,860

SPRING RAIL CLAMP

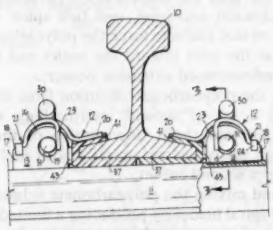
Albert Edward Rex, 38 Halifax Street, Adelaide, South Australia, Australia

Filed Sept. 8, 1976, Ser. No. 721,274

Claims priority, application Australia, Apr. 6, 1976, 5511/76; Apr. 15, 1976, 5617/76

Int. Cl.[2] E01B *9/04, 9/62*

U.S. Cl. 238—349 **8 Claims**



8. A method of securing a pair of rails to a tie comprising stud welding two pairs of shoulder lugs to the tie in such postion that they locate said rails with respect to the tie when rails are positioned between the lugs of the respective pairs, each shoulder having a bearing surface extending in a direction away from the foot of the rail to be located thereby, each shoulder by having and an aperture extending therethrough in a direction parallel to the longitudinal direction of said rails, positioning lower portions of a pair of rail insulating pads on the tie, each said pad having a pair of upwardly extending webs each with a return portion, positioning rails on respective said lower portions and said return portions on the respective upper surfaces of the foot of the rails,

engaging said respective plate-like clips over said respective lugs, said clips having toes positioned on respective said pad return portions and heels positioned on said shoulder lug upper surfaces,

and positioning one leg of a U-shaped pin through the aperture of each respective shoulder lug, and the other leg over the respective plate like clip to bear downwardly thereon and thereby apply downward pressure on the respective rail foot.

4,074,861

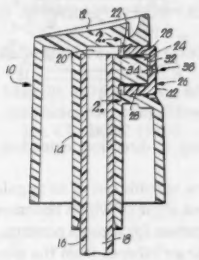
SPRAY PATTERN CONTROL STRUCTURE AND METHOD

Wallace F. Magers, Leawood, Kans., and James M. Jegen, Lee's Summit, Mo., assignors to Realex Corporation, Kansas City, Mo.

Filed June 18, 1976, Ser. No. 697,346

Int. Cl.[2] B05B *1/34*

U.S. Cl. 239—492 **1 Claim**



1. In a fine mist sprayer having a discharge orifice provided with a hole, a fluid exit at one end of the hole, a fluid entrance at the opposite end of the hole, and a continuous annular wall extending between said entrance and said exit, said sprayer further having an exposed outer face departing from said exit in transverse relationship to the longitudinal axis of the orifice and means for propelling one or more swirling streams of liquid particles along said wall from the entrance toward the exit, the improvement comprising:

a uniformly smooth, flawless, annular surface flaring outwardly toward said face from said wall devoid of a line of intersection with the latter for launching the swirling particles from said wall at substantially random points along said surface, whereby to produce a substantially circular spray pattern having uniform particle distribution throughout,

said launching surface defining a curve generated from a tangent point on said wall and extending through a greater than 90° arc so as to project outwardly beyond said face in the nature of a rim around said hole.

4,074,862

ADJUSTABLE FLOW AIR INSUFFLATION NOZZLE

Pierre Jardinier, Gournay sur Marne; Jack Simonnot, Ozoire la Ferriere, and Robert Lecerf, Neuilly sur Marne, all of France, assignors to Societe d'Etudes et de Recherches de Ventilation et d'Aeraulique, Gournay sur Marne, France

Filed July 16, 1976, Ser. No. 705,941

Claims priority, application France, July 23, 1975, 75 23022

Int. Cl.[2] F24F *13/06*

U.S. Cl. 239—515 **10 Claims**

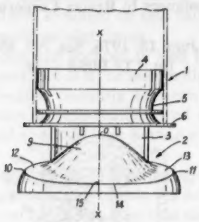
1. An insufflation nozzle for air to be used in room ventilation, air conditioning and like systems, the nozzle having a plane of symmetry and comprising in combination:

a sleeve having an outlet orifice and an inlet which is symmetrical about an axis of the nozzle;

a deflector disposed to face said outlet orifice of said sleeve and extending transversely with respect to said axis; and

linking means between said deflector and said sleeve so as to permit a translational movement of these two components relative to one another in a direction parallel to said axis for allowing volume flow rate of air to be varied including a screen which is symmetrically disposed with respect to said plane of symmetry for the purpose of shutting off

passage of air between said sleeve and said deflector in a specific, given angular sector, a surface of said deflector being directed toward said sleeve and having, at least in the vicinity of its edges adjacent said screen, planar portions which are inclined relative to said axis, and having a spacing relative to said outlet orifice of said sleeve which



increases along a direction extending away from said screen;

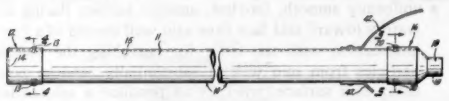
whereby air flow spreads out in an angular sector, the horizontal included angle of which becomes larger as the flow rate of air increases for a given pressure upstream from the screen and the air escapes from the nozzle along an initial path substantially normal to the axis of the sleeve.

4,074,863

PORTABLE OPEN FIREPLACE BLOWING APPLIANCE

Mary Evelyn Davis, 12319 Charles Road, Silver Spring, Md. 20906

Filed Feb. 21, 1975, Ser. No. 551,546
Int. Cl.² F23L 9/06
U.S. Cl. 239—589 **1 Claim**



1. A portable open fireplace blower comprising:

an open rigid straight line tubular body portion of substantial length and uniform diameter formed of heat resistant metal;

an end cap rivetedly secured at one end of said body portion having in a planar end section a centrally located orifice between 1/32 of an inch and 3/32 of an inch through which a jet of air is blown after placing the mouth of the user at the other end to blow, said cap having the same inside diameter as the outside diameter of said tubular body portion and the inside diameter of said tubular body being at least 6 times the diameter of said centrally located orifice;

a mouthpiece connector having an end opening whose inner diameter is substantially the same as that of said tubular body portion and is non-adhesively secured at the end of said body portion opposite said cap and orifice;

said mouthpiece connector including a tapered portion extending from the end of the tubular body and an end portion of substantially smaller diameter than said tubular body attached to the tapered portion; a mouthpiece mounted on the end portion of said connector;

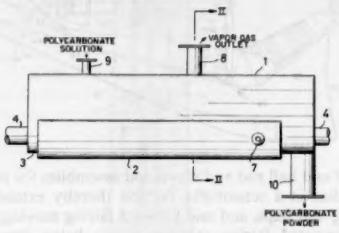
and said centrally located orifice being on the common central longitudinal axis of said body portion and said mouthpiece whereby a long column of air in said body portion under mouth pressure of the user exits as a fine single air jet along said common axis to permit accurate impingement of the air on a burning coal.

4,074,864

METHOD FOR PRODUCING POLYCARBONATE POWDER FROM A POLYCARBONATE SOLUTION

Yoshihiro Narita, Sodegaura; Shigeaki Mochizuki; Shigeru Kakimoto, both of Tokuyama; Norio Komori, Sodegaura; Kiyoshi Watanabe, Sodegaura, and Hideji Shiota, Sodegaura, all of Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 618,427, Oct. 1, 1975, abandoned. This application Apr. 27, 1977, Ser. No. 791,521
Claims priority, application Japan, Oct. 5, 1974, 49-114851
Int. Cl.² B02C 13/10
U.S. Cl. 241—23 **8 Claims**



1. A process for the continuous production of polycarbonate powder from a polycarbonate solution in a processing zone defined by an elongated part-cylindrical barrel member having two elongated shafts therein, the longitudinal axes of said shafts being substantially parallel, said shafts being rotatable about their longitudinal axes and being oriented generally axially of the barrel member, the process comprising:

a. feeding a polycarbonate solution to an inlet at an end portion of said elongated barrel member, said barrel member having an outlet at the end thereof opposite the inlet;

b. rotating said shafts toward each other about their longitudinal axes and forcing the polycarbonate solution toward the outlet by first intermeshing spiral blades mounted on said shafts, said first spiral blades being located on said shafts so that they are located at the portion of said barrel at least adjacent said inlet, said first spiral blades being arranged on said shafts to force the polycarbonate solution received at the inlet toward the outlet end of the barrel with a predetermined extrusion power;

transferring the polycarbonate solution from the first spiral blades to a set of second intermeshing spiral blades mounted on said shafts downstream of the first spiral blades, and set of second spiral blades including a first subset and a second subset;

d. heating and mixing the polycarbonate solution by the set of second spiral blades by producing a limited "to and fro" movement of the polycarbonate solution by means of the set of second spiral blades as the polycarbonate solution is moved toward the barrel outlet under the extrusion power provided by said first spiral blades, a first portion of the first subset of the set of second spiral blades feeding the polycarbonate forward toward the barrel outlet and a first portion of the second subset of the set of second spiral blades feeding the polycarbonate backward toward the barrel inlet to forcedly mix the polycarbonate solution fed into the barrel member and to evaporate and drive off said solvent in said polycarbonate solution under the influence of said heating to thereby concentrate said polycarbonate solution;

e. heating and kneading said concentrated polycarbonate solution in the barrel member by at least second portions of said first and second subsets of spiral blades downstream of said first portions to further evaporate and drive off said solvent in said polycarbonate solution and to form polycarbonate powder particles at least in the vicinity of the outlet of the barrel member;

f. heating and grinding the polycarbonate powder by at least

third portions of said first and second subset spiral blades downstream of said second portion and in the vicinity of said outlet of said barrel member to further reduce the particle size of the polycarbonate powder particles and to dry reduced size polycarbonate powder particles; and then

g. discharging the ground reduced size polycarbonate powder particles from the outlet of the barrel member under the extrusion power provided by said first spiral blades which provides continuous movement of the materials through the processing zone in said barrel member.

4,074,865

METHOD OF RECOVERING PLATINUM GROUP METAL VALUES FROM A USED WASHCOATED CATALYST

Alan Gibbon, London, England, assignor to Johnson, Matthey & Co., Limited, London, England

Filed Sept. 6, 1974, Ser. No. 504,670

Claims priority, application United Kingdom, Sept. 11, 1973, 42680/73

Int. Cl.[2] **B07B** *4/00;* **C01G** *55/00;* **C22B** *11/00;* **B02C** *23/08*

U.S. Cl. 241—24 **6 Claims**

1. A method of recovering platinum group metal values from a used washcoated catalyst comprising a catalyst support having a catalytic washcoat thereon including platinum group metal, said method comprising grinding the catalyst to obtain fines which are less than 10 μm and tails which are greater than 10 μm, at least 40–55% of the ground catalyst being −400 mesh and the fines containing most of the platinum group metal values, and separating the fines from the tails using a cut point of 10 μm.

4,074,866

RELEASABLE COMPRESSION DEVICE FOR USE WITH A CRUSHING MILL OR THE LIKE

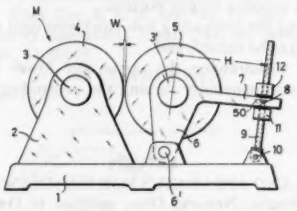
Heinz Meder, Forsbach, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Sept. 3, 1976, Ser. No. 720,369

Claims priority, application Germany, Sept. 10, 1975, 2540269

Int. Cl.[2] **B02C** *4/32*

U.S. Cl. 241—30 **15 Claims**



1. A crushing mill having a releasable compression device to allow the non-destructive passage of foreign matter through said mill comprising:

a mill body having a base carrying a fixed upright;

a first roller rotatably carried by said fixed upright;

a second roller rotatably carried by an L-shaped support frame having a substantially vertical arm portion pivotally attached to said base to allow adjustment of a nip formed between said rollers;

a substantially horizntal arm portion having a vertical aperture in the end thereof carried by said support frame;

a threaded rod disposed in said aperture and having a bottom end pivotably attached to said base;

an upper and lower threaded nut carried on said rod and positioned above and below said arm of said support frame;

roatational socket means carried by said threaded rod between said arm and said upper and lower nuts to provide a sliding fit between said rod and said aperture;

a compression means carried between said rotational socket means and said lower nut to produce a compression joint between said nuts and said arm; and

pressure means connected to said compression means to supply a selective pressure to said compression means;

whereby a maximum and minimum dimensional limit of said nip is fixed by said upper and said lower nut and said second roller can adjust between said limits as a function of said selected pressure.

4,074,867

METHOD AND APPARATUS FOR COMMINUTING SAND CLODS

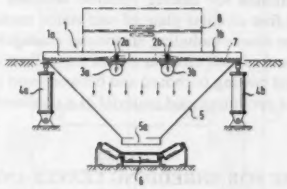
Hermann Jacob, Fachenfelderweg 115, 2105 Seevetal 3, Germany

Filed May 20, 1976, Ser. No. 688,291

Claims priority, application Germany, May 23, 1975, 2522940

Int. Cl.[2] **B02C** *19/00*

U.S. Cl. 241—30 **11 Claims**



1. A method for removing form sand from a casting box and for comminuting any sand clods formed by the sand removed from the box, comprising the steps of placing a casting box having an open side with the sand and the cast product therein with the open side of the box on a planar substantially horizontally extending upper surface of a grate; subjecting said grate to vibrations until the sand becomes disconnected from the casting box wall and falls partly through the grate; removing the casting box and the cast product from the grate while leaving any remaining sand clods thereon; and subjecting said grate again to vibrations while changing the planar horizontally extending upper grate surface to a surface extending upwardly inclined from a center line of said grate.

4,074,868

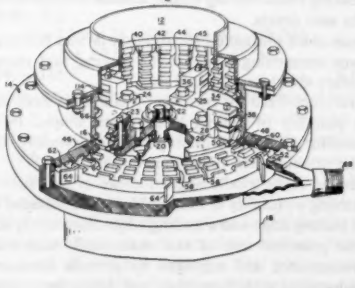
FOOD PROCESSING SYSTEM

Donald F. Link, Huntsville, Ala., assignor to Recovery Systems, Inc., Charleston, S.C.

Filed Feb. 7, 1977, Ser. No. 766,132

Int. Cl.[2] **B02C** *13/16*

U.S. Cl. 241—46 R **5 Claims**



1. A food processor comprising a pulverizer, in turn comprising:

a stator member comprising:

a vertically oriented interior surface, the top end of which forms an input opening to said pulverizer, and said surface having a plurality of vertically and circumferentially spaced lands and grooves, and

a first circular plate extending around and radially outward from a lower end of said interior cylindrical surface, and having a lower, generally horizontal, surface comprising a plurality of concentrically and circumferentially spaced lands;

a motor and rotor member driven therefrom, and said rotor member comprising a second circular plate positioned for rotation about a vertical axis concentric with said cylindrical surface of said stator member, and further comprising:

at least one hammer rotably attached to said second circular plate for horizontal pivotal movement about a vertical axis, said hammer being positioned to pass within a groove formed between said lands of said cylindrical surface of said stator member, and

a plurality of concentrically and circumferentially spaced lands and grooves in said second circular plate and positioned for mating rotation between said lands of said first circular plate of said stator member; and

collection means including an annular passageway generally outboard of said circular plates for collecting pulverized material passing outboard and between said circular plates and for providing said material as a confined output flow.

4,074,869

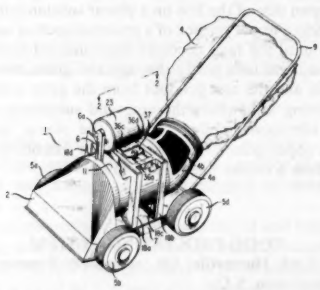
MACHINE FOR SHREDDING LEAVES AND GARDEN DEBRIS

Walter G. Johnson, 39 Pitt Road, Boonton, N.J. 07005

Filed Mar. 11, 1977, Ser. No. 776,648

Int. Cl.[2] B02C *18/24*

U.S. Cl. 241—55 **8 Claims**



1. A device for shredding garden debris which comprises in combination:

a housing frame having intake, exhaust and collecting means for said debris,

a main shaft journalled for rotation in said housing frame,

means comprising a motor for driving said main shaft to rotate about its principal axis,

a first rotor fixed for rotation by said main shaft and having a plurality of cutting blades each shaped to include a leading edge and a trailing edge transversely disposed to the principal axis of said main shaft,

a second rotor axially aligned ahead of said first rotor and having a plurality of cutting blades each shaped to include a leading edge and a trailing edge transversely disposed to the principal axis of said main shaft, said rotors being constructed and arranged to provide between them a substantial axial flow of air and debris from said intake to said exhaust means,

the trailing edges of the blades of said second rotor being slightly spaced apart in an axial direction in cutting relation from the leading edges of the blades of said first rotor,

gear reducing means connected to said main shaft and coupled to drive said second rotor at a rotational rate which is substantially less than the rotational rate of said first rotor.

4,074,870

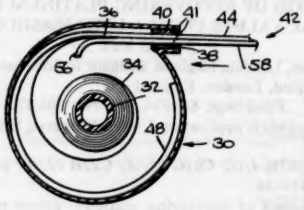
FILM RETRIEVAL DEVICE

Marshall Kaufman, 413 W. 56th St., New York, N.Y. 10019

Filed July 22, 1976, Ser. No. 707,654

Int. Cl.[2] B25B *9/00;* **G03B** *1/02*

U.S. Cl. 242—1 **10 Claims**



7. A method of retrieving a free end of a convolutely wound film from inside a cylindrical cassette through an exit opening in a circumferential wall on said cassette, comprising:

(a) inserting a two-part retrieval device into the cassette through the exit opening, said retrieval device having an upper and lower component which slidingly engage each other in a longitudinal direction, said upper component having an anterior tongue portion and said lower component having a curled, anterior tongue portion;

(b) arranging the components with the cassette so that the upper component lies adjacent most of the interior cylindrical wall of the cassette, while the curled anterior tongue portion of the lower component forms a film-receiving channel with the upper component adjacent the exit opening;

(c) rotating the protruding hub of the cassette counterclockwise until the end of the film leader passes the end of the curled, anterior tongue portion;

(d) rotating the protruding hub clockwise until said hub can no longer be turned; and

(e) then withdrawing the upper and lower components while simultaneoulsy turning the protruding hub clockwise.

4,074,871

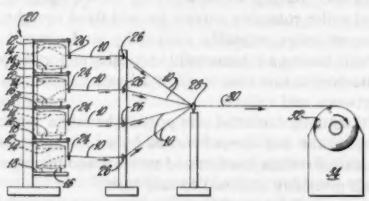
METHOD AND APPARATUS FOR HANDLING STRANDS

David V. Stotler, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 28, 1976, Ser. No. 736,675

Int. Cl.[2] B65H *63/02, 63/00*

U.S. Cl. 242—42 **8 Claims**



1. The method of producing combined strand of the type in which feeder strands from a plurality of feeder packages are

gathered into a combined strand, wherein the improvement comprises:

sensing the cessation of passage of a strand from any of said feeder packages into said combined strand; and,

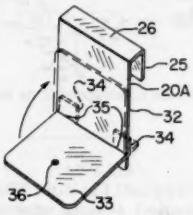
introducing an auxiliary strand into fixed engagement with said combined strand or a feeder strand responsive to said sensing.

4,074,872

EMERGENCY BATHROOM TISSUE HOLDER

Robert Marshall, Jr., 731 S. Cascade Drive, Woodburn, Oreg. 97071

Filed Dec. 20, 1976, Ser. No. 752,208
Int. Cl.[2] B65H *19/00*
U.S. Cl. 242—55.54 **6 Claims**



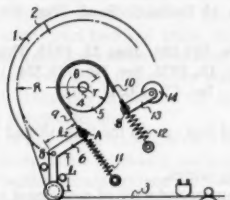
1. An emergency bathroom tissue holder comprising an L-shaped bracket having a vertical leg with transverse slots and a horizontal leg outstanding from the lower end of said vertical leg, a vertical upstanding pin on said horizontal leg for holding a roll of paper on said horizontal leg, a hook on the upper end of said vertical leg for hanging the holder on the upper edge of the wall of a toilet tank, and a hinge connecting said horizontal leg to said vertical leg, said hinge comprising a pair of right angle tongues on said horizontal leg having pivotal movement in said slots in said vertical leg.

4,074,873

TENSION SERVO APPARATUS

Hideaki Hayashi, and Susumu Kakuta, both of Mitaka, Japan, assignors to Nippon Columbia Kabushikikaisha, Tokyo, Japan

Filed Dec. 6, 1976, Ser. No. 747,980
Claims priority, application Japan, Dec. 10, 1975, 50-147772; May 26, 1976, 51-59995
Int. Cl.[2] B65H *25/22*
U.S. Cl. 242—75.43 **13 Claims**



1. A mechanical tension servo apparatus for maintaining the tension of a reel-transported tape substantially constant comprising:

means for mounting said reel for rotation,

a rotary member connected to said means and conjointly rotatable with said reel;

brake means including a brake element engageable with said rotary member and resilient biasing means for exerting a selected force thereon

tension detecting means for detecting the tension of a tape being transported from said reel;

means for regulating said biasing means to vary the force of said brake element against said rotary member in accordance with changes in the force applied to said tape tension detecting means, whereby

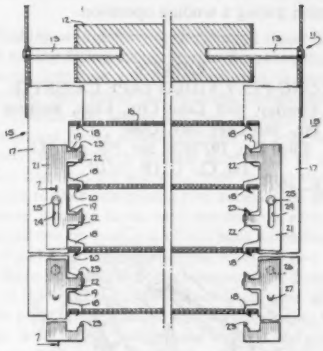
the biasing force is decreased in response to an increase in tape tension and is increased in response to a decrease in tape tension.

4,074,874

LOCK PLATE FOR AN ARM OF A PILE FABRIC REEL FRAME

Theodore P. Kessler, Rancocas, N.J., assignor to Timron, Inc., Moorestown, N.J.

Filed Jan. 15, 1976, Ser. No. 649,335
Int. Cl.[2] B65D *85/67;* **B65H** *75/02*
U.S. Cl. 242—77.1 **16 Claims**



1. An end frame for a pile fabric reel comprising:

a plurality of hook-containing sections disposed in a radiating manner for impaling of a pile fabric thereon; and

a lock plate movably mounted on each said hook-containing section to retain an impaled pile fabric thereon, each said lock plate including a plurality of spaced projections, at least some of said projections being movable between a first position spaced from a respective one of said hooks of said one hook-containing section and a second position closer to said one hook to retain impaled fabric therebetween.

4,074,875

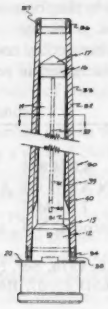
TEXTILE CARRIER

Jules P. Fratturo, Greenville, S.C., assignor to Textube Corporation, Greer, S.C.

Filed May 21, 1976, Ser. No. 688,733
Int. Cl.[2] B65H *75/30, 75/10*
U.S. Cl. 242—118.3 **6 Claims**

2. A textile carrier comprising a barrel, said barrel having an outside wall surface tapering inwardly from lower to upper end thereof and an inside wall surface correspondingly tapering inwardly from lower to upper end whereby the wall of said barrel is of generally uniform thickness throughout its length, and spindle positioning means comprising a plurality of spaced ribs on said inside wall surface extending longitudinally of said barrel and originating at a predetermined distance from said lower end, each of said ribs having a first portion tapering inwardly from said inside wall surface and thereafter a second portion extending generally parallel to the longitudinal axis of said barrel to a point of termination flush with said inside wall

surface at a predetermined distance below the upper end of the barrel, whereby said positioning means closely surround a



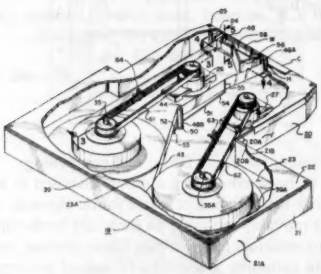
spindle to be received in said barrel to stabilize said textile carrier thereon during a wnding operation.

4,074,876

LONG-PLAY VIDEO TAPE CASSETTE

Dennis R. Gourley, Salt Lake City, Utah, assignor to Film Cassette Inc., Salt Lake City, Utah

Filed Jan. 19, 1976, Ser. No. 650,413
Int. Cl.[2] G11B *23/10*
U.S. Cl. 242—199 **8 Claims**



1. For a video tape player having a planar surface and an inwardly directed rectangular slot disposed normal to said surface, a long-play video tape cassette including, in combination, a housing having an enlarged portion and a lateral essentially rectangular tongue extending therefrom and provided with a tape sensing window, said enlarged portion and said lateral tongue having proximate, planar, outer surfaces forming essentially a 90° inside angle, whereby said planar surface of said enlarged portion may be disposed parallel to and proximate said housing and said planar surface thereof; a pair of video tape reels journalled in said enlarged portion for operative movement; first means mounted in said lateral tongue for driving said reels; and second means for routing the video tape of said reels up to and past said window, said reels being provided video tape.

4,074,877

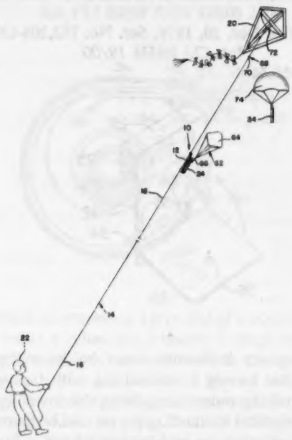
AERIAL DEVICE

Godfrey B. Hayenga, 4667 Alhambra Drive, Fremont, Calif. 94536

Filed Nov. 10, 1976, Ser. No. 740,422
Int. Cl.[2] A63H *27/08*
U.S. Cl. 244—155 R **8 Claims**

1. An aerial device in combination with an object transportable along a line elevated above a surface, the improvement comprising:

a. support means intended for releasably gripping the object, said support means being born by the elevated line, said support means comprising a first member engaging the object toward one end thereof; a second member engaging the object toward the other end thereof, said second member including confining means for restricting the distance between said first member and said second member, said first and second members acting in concert by said engagements to effect the intended support of the object;



and spring means for urging gripping engagement of the object by said first and second members, said urging engagement of said spring means guided by said confining means, said spring means allowing disengagement of the object by said first and second members;

b. traveling means intended for carrying the object along the elevated line;

c. trigger means for initiating the release of said support means gripping the object, thereby overcoming the spring force of said spring means urging engagment of the object by said first and second members.

4,074,878

PROGRAMMED FLAP SYSTEM FOR AN AIRCRAFT HAVING WINGS

Irving R. Sherman, 31 Redlands Road, West Roxbury, Mass. 02132

Division of Ser. No. 589,188, June 23, 1975. This application Aug. 18, 1976, Ser. No. 715,234
Int. Cl.[2] G05D *1/12*
U.S. Cl. 244—183 **10 Claims**

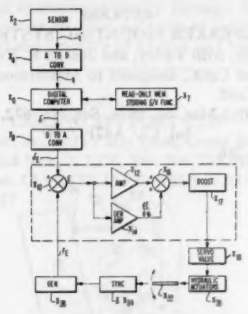
1. A programmed flap system for take-off and landing comprising,

an aircraft having wings,

means for sending the velocity of movement of the aircraft through the air,

flap means on each wing, each providing at least one rearwardly convergent air compressor channel having an entrance opening and an exit opening which channel increases the exit velocity or through-flowing air relative to the entrance velocity thereof according to channel characteristics, means for varying the area of the entrance opening of said channels, programmed control means for operating the last-named means according to a program based upon channel characteristics which commands at lift-off an entrance opening for said channels which is of

larger area than the average entrance opening during the preceding take-off ground run while limiting the exit velocity of said air subsequent to lift-off to less than sonic velocity.

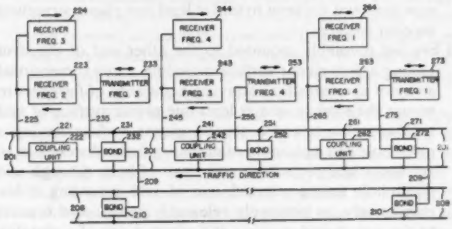


4,074,879

TRACK SIGNALLING SYSTEM

Gary E. Clark, Henrietta; Klaus H. Frielinghaus, and Barry L. Smith, both of Rochester, all of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Nov. 29, 1976, Ser. No. 745,703
Int. Cl.[2] B61L *21/06*
U.S. Cl. 246—37 **7 Claims**



1. In a track circuit signalling system comprising in combination:

(a) a two rail track divided into a plurality of contiguous track circuits separated by boundary markers;

(b) individual transmitter means, coupled to said track at alternate boundary markers by first coupling means bridged across said two rail track, for applying signals across said track at a carrier frequency and with the carrier frequency of each transmitter means differing from the carrier frequency of the nearest adjacent transmitter means on either side; and

(c) one pair of individual receivers each coupled across said track at intermediate boundary markers by an individual second coupling means bridged across said two rail track with one receiver adapted to respond to track signals from the adjacent transmitter means on one side of the receiver pair and the other receiver of each receiver pair adapted to respond to track signals from the adjacent transmitter means on the other side of the receiver pair; and wherein

(d) each said second coupling means comprises:

(1) a series tuned circuit with each pair of second coupling means coupled in parallel;

(2) an impedance matching transformer for producing an output signal is response to signals received from said track; and with

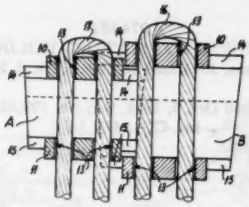
(3) the output of the transformers of each pair of second coupling means coupled in series to provide a pair of output terminals.

4,074,880

CLIMBING WEDGE

Ludger Simond, Les Bossons, Chamonix, Haute-Savoie, France

Filed Jan. 12, 1977, Ser. No. 758,853
Int. Cl.[2] A47G *29/00*
U.S. Cl. 248—1 **4 Claims**



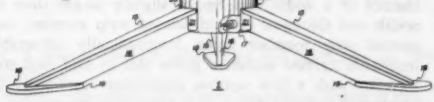
1. A climbing wedge having the general shape of a hollow prism and having fitting means thereon for preventing rotation and jamming into one another when two or more of said wedges of the same shape but different dimensions are fitted together, wherein said wedge has two opposite parallel faces and wherein said fitting means comprises at least one boss on each of said two opposite parallel faces, each of said bosses having two openings for allowing rope to pass through, said fitting means further comprising two recesses on each of said two opposite parallel faces, said recesses on each said face being situated one on each side of said boss, extending from the end side of said face toward said boss, whereby two wedges of the same shape but different dimensions may be fitted together by virtue of the two opposite bosses of the wedge with smaller dimensions penetrating into the two corresponding recesses in the wedge with larger dimensions, without the necessity of removing any ropes passing through the openings in said bosses of said wedges.

4,074,881

TRIPOD ASSEMBLY

Gardner Lloyd Bickford, Palos Verdes Estates, Calif., assignor to James R. Vickery, La Mesa, Calif.

Filed June 23, 1976, Ser. No. 698,967
Int. Cl.[2] F16M *11/20*
U.S. Cl. 248—188.7 **1 Claim**



1. A tripod assembly for receiving and carrying a load bearing standard, comprising

a bearing ring having an inner diameter dimensioned for receiving a load bearing standard and being generally cylindrical in shape;

hinge extensions extending downwardly and inwardly from said bearing ring, said hinge extensions including radially extending slots therethrough, each said slot including a substantially flat surfaced recess extending perpendicu-

larly relative to said slot, each said flat surfaced recess extending as a cord across said generally cylindrical bearing ring and being outwardly of one of said slots; and

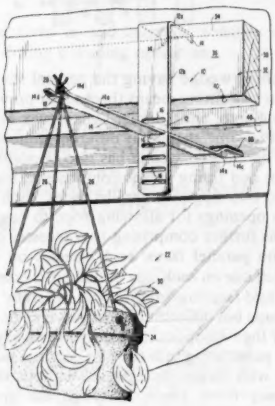
three legs rotatably carried by said hinge extensions, each said leg including a vertically oriented portion extending into one of said slots and a horizontally oriented flat portion above said vertically oriented portion outwardly from said slot and dimensioned for abutment with one of said substantially flat surfaced recess when said leg is rotated in an extended position.

4,074,882

FLOWER POT SUPPORT HOLDER

John H. Anderson, 308 Canal St., R.F.D. No. 3, Brattleboro, Vt. 05301

Filed Oct. 5, 1976, Ser. No. 729,631
Int. Cl.[2] A47F *5/00*
U.S. Cl. 248—208 **2 Claims**



1. A height and laterally adjustable flower pot holder comprising:

a first elongated strip forming a unitary bracket member of inverted L-shaped configuration including a horizontal base portion,

a vertical depending hanger portion at right angles thereto and integral therewith,

said base portion terminating at an end remote from said depending hanger portion in at least one integral lip portion extending parallel to and generally in the direction of said depending hanger portion and thereby forming with said base and said depending hanger portion a hook for hooking the upper end of said bracket member over a horizontal window trim board or the like,

a second elongated strip member defining a hanger bar and being of a width less than that of the first strip member,

said first strip member including a plurality of vertically spaced horizontal, elongated slots within the lower end thereof of a width and height slightly larger than the width and thickness of said second strip member, said second strip member being longitudinally adjustably, insertably carried within a given slot of said first strip member with a first portion projecting rearwardly beneath said window frame and contacting the bottom of said frame and a second portion projecting horizontally outwardly of said first strip portion, and

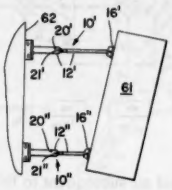
means for suspending a flower pot from the outboard end of said second portion of said second strip member, such that said second strip member is inserted within a given slot of said first strip member dependent on the vertical height of the horizontal window trim board and said second strip member is adjusted longitudinally within a selected slot to adjust the distance between the suspended flower pot and the horizontal window trim board to thereby permit suspending of various size flower pots.

4,074,883

SPEAKER MOUNTING SYSTEM

George W. Daly, Mill Valley, and Joseph R. Rucker, San Francisco, both of Calif., assignors to Mastermount Corporation, Petaluma, Calif.

Filed Mar. 31, 1976, Ser. No. 672,176
Int. Cl.[2] A47F *5/00*
U.S. Cl. 248—286 **4 Claims**



1. A device for mounting a speaker cabinet having at least one planar surface for mounting to at least one planar structural support surface comprising:

a telescoping strut including two mutually extensible and rotatable members;

means for releasably positively fixing the relative extension and rotational position of said members;

a flange fixed to one end of the telescoping strut, said flange having at least one planar surface including a two dimensional array of apertures for receiving a plurality of fasteners to mount the strut to said at least one planar structural support surface;

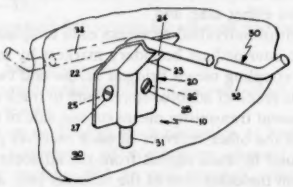
a bracket pivotably mounted to the other end of the strut having a first planar surface including a two dimensional array of apertures for receiving a plurality of fasteners to mount the strut to said at least one planar surface of said speaker cabinet; and a second planar surface having a pivot hole and a plurality of mounting holes disposed in an arc about said pivot hole and a pair of bolts through said pivot hole and a selected one of said mounting holes, respectively, to positively releasably mount said bracket to the end of said member at a selected one of a plurality of angular orientations.

4,074,884

PIVOTED LOCKING WALL BRACKET

Alex Joseph Antoszewski, Michigan City, Ind., assignor to Leigh Products, Inc., Coopersville, Mich.

Filed Aug. 30, 1976, Ser. No. 718,904
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—289 R **11 Claims**



1. In a bracket having a hook and a base plate adapted to be mounted to a vertical surface, said hook having an outwardly extending arm and a vertically extending leg; said base plate having an outwardly offset portion forming a channel in the back face thereof for receiving the leg of said hook, the improvement in said bracket comprising:

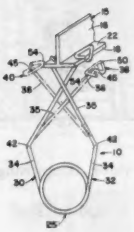
a segment of the metal forming said offset portion being removed, said removed portion being spaced from the top of said base plate; said base plate being bent outwardly to an inclined position about a line normal to the axis of said channel and extending laterally through the area of the removed portion to form an inclined pocket for seating said hook at the juncture of its arm and leg portions.

4,074,885

CEILING SUPPORT CLIP

Walter L. Hacker, Jr., 2221 Patty Lane, Green Bay, Wis. 54304

Filed Nov. 2, 1976, Ser. No. 738,018
Int. Cl.[2] B42F *13/00*; A44B *21/00*
U.S. Cl. 248—317 **3 Claims**



1. A ceiling support clip formed of wire and adapted to be removably secured to a ceiling post, comprising:

a. a spring loop at one end of the clip,

b. a pair of arms diverging forwardly from said loop to provide finger grips, each said arm including a lower section extending outwardly from said loop, and an upper section being extended in forwardly converging relation and crossing adjacent the front end thereof; and said upper sections of said arms being compressed to open said jaws with said upper sections formed into a V-shaped configuration above the crossing therebetween,

c. gripping jaws formed on said front ends of said upper sections and including a gripping element extending in a plane substantially normal to the plane of said arms and adapted to move towards and away from each other as said arms are compressed and released to engage the ceiling post and suspend the support clip therefrom, said jaw including a bridge section extending angularly from said front end to one end of said gripping element and a tail section extending angularly from the other end of said gripping element and terminating in a free end,

d. said gripping element, bridge section, and tail section all extend in a substantially horizontal plane relative to the vertical axis of the clip, and

e. said respective bridge sections of each said arm extend in substantially parallel spaced relationship to each other, with said respective tail sections of each said arm extending in substantially parallel spaced relationship to each other, and said gripping elements extending in substantially parallel spaced relationship to each other such that each said jaw forms a substantially triangular configuration.

4,074,886

HEIGHT ADJUSTMENT MECHANISM FOR A VEHICLE SEAT

Brian Yates, Bozeat, England, assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 7, 1977, Ser. No. 775,077
Int. Cl.[2] F16M *11/24*
U.S. Cl. 248—394 **6 Claims**

1. A vehicle seat comprising,

a seat frame,

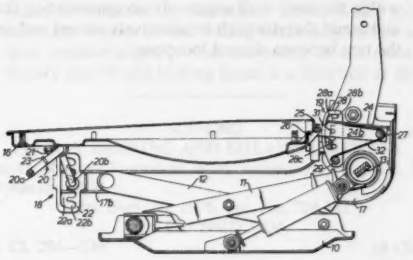
a seat cushion frame,

two cushion-height adjustment mechanisms mounted on the seat frame at the front and back of the seat respectively and supporting the front and back of the seat cushion frame for independent movement upwards and downwards with respect to the seat frame,

one of said height adjustment mechanisms comprising

hinge means pivoted to the seat frame and to the seat cushion frame respectively on horizontally-spaced parallel pivots extending laterally of the seat, to allow the cushion frame to be raised or lowered pivotally,

a spring mounted on the seat frame and biassing the hinge means upwardly,



two co-operating locking means comprising a pin, and a rack having teeth spaced apart vertically to receive the pin therebetween in vertically downward load-supporting relationship,

means mounting one of said locking means on the seat frame,

means mounting the other of said locking means on the hinge means and cushion frame assembly,

one of the mounting means being a pivot on which the associated locking means is supported, and

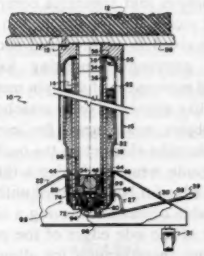
biassing means acting on the pivotally supporting locking means to urge the two locking means into mutual engagement.

4,074,887

POWER UNIT FOR A MEDICAL OR LIKE STOOL

Dean H. Hale, 2424 N. Main St., Logan, Utah 84321

Filed Sept. 20, 1976, Ser. No. 724,889
Int. Cl.[2] F16M *11/00*
U.S. Cl. 248—404 **4 Claims**



1. A power unit for advancing and retracting an object comprising:

hollow cylindrical ram means comprising means at one end of the hollow ram means adapted to be connected to said object and closure means entirely closing the other end of the ram means, said ram means being relatively reciprocable between extended and retracted positions;

elongated hollow reservoir forming means co-axially and, when in the retracted position, substantially co-extensive with the ram means, the reservoir means comprising a generally elongated annular reservoir cavity defined by a cylindrical inner wall juxtaposed and relatively reciproca-

ble in respect to the ram means, and a generally cylindrical U-shaped outer wall spaced from said inner wall, the respective ends of the inner and outer walls being integrally connected to each other, said inner wall comprising port means adjacent one end thereof, the outer wall conically converging at one end thereof, the reservoir cavity containing liquid and pressurized gas acting upon and selectively displacing the liquid through the port means; valve means disposed in its entirety within said cylindrical inner wall adjacent the port means, and a space intermediate the closure means and the valve means contained within the inner wall selectively accommodating flow of said liquid therethrough to selectively extend and retract the ram between desired locations.

4,074,888

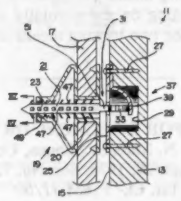
APPARATUS FOR LOCKABLY MOUNTING PICTURE FRAMES AND THE LIKE

George H. Garner, 6528 Palomino, Arlington, Tenn. 38002

Continuation-in-part of Ser. No. 513,245, Oct. 9, 1974, abandoned. This application Mar. 11, 1976, Ser. No. 666,180

Int. Cl.[2] A47F *7/14*

U.S. Cl. 248—475 R **4 Claims**



1. Apparatus for mounting a portable object having a back side to a fixed surface, said apparatus comprising at least one anchoring socket means fixedly attached to said fixed surface, a pin member received in each of said socket means with a portion thereof grippingly engaging said socket means whereby outward movement of said pin member is precluded, at least one platelike element fixedly attached to the back side of the portable object, guide means for locating the optimum position of said platelike element on the back side of the portable object, said guide means including a thin, rigid body portion having a top edge for being aligned with the top or bottom edge of the portable object and having a side edge for being aligned with one of the side edges of the portable object and having an aperture therethrough for allowing a mark to be made therethrough with a pencil or the like on the back side of the portable object when said body portion is positioned on the back side of the portable object with said top edge aligned with the top or bottom edge of the portable object and with said side edge aligned with one of the side optimum of the portable object, said mark corresponding to the optmum position of the center of said platelike element, and lock means for removably locking said platelike element to said pin member with said lock means being hidden from view and being substantially inaccessible without special tools to obscure the structure thereof whereby unwarranted removal of the object from the fixed surface is minimized.

4,074,889

ROTARY VALVE

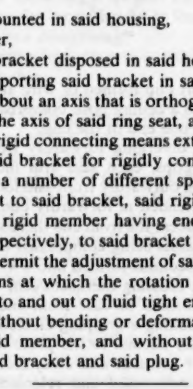
Hans O. Engel, Hanau, Germany, assignor to Honeywell G.m.b.H., Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 636,107, Nov. 28, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 764,412

Claims priority, application Germany, Feb. 28, 1975, 2508755

Int. Cl.[2] F16K *1/18*

U.S. Cl. 251—298 **13 Claims**



1. A rotary control valve, comprising

a housing,

a ring seat mounted in said housing,

a plug member,

an actuating bracket disposed in said housing,

means for supporting said bracket in said housing so that it can rotate about an axis that is orthogonal and offset with respect to the axis of said ring seat, and

an adjustable rigid connecting means extending between said plug and said bracket for rigidly connecting said plug in any one of a number of different spaced apart positions with respect to said bracket, said rigid connecting means including a rigid member having ends which are rigidly secured, respectively, to said bracket and to said plug in a manner to permit the adjustment of said plug to that one of said positions at which the rotation of said bracket tilts said plug into and out of fluid tight engagement with said ring seat without bending or deformation of said bracket or said rigid member, and without relative movement between said bracket and said plug.

4,074,890

MULTI-STAGE HYDRAULIC STRETCHER FOR ELONGATED FASTENERS

Georges Boudet, Saint-Cyr-sur-Loire; Jacques Charpentier, Tours; René Vinel, Bourg-la-Reine; Jean-Claude Desmoulins, Conflans-Sainte-Honorine, and Emmanuel de Blic, Tours, all of France, assignors to SKF Compagnie d'Applications Mecaniques, Clamart, France

Filed Oct. 26, 1976, Ser. No. 735,780

Claims priority, application France, Oct. 27, 1975, 75 32764

Int. Cl.[2] E21B *19/00*

U.S. Cl. 254—29 A **6 Claims**

1. An hydraulic device for an elongated fastener which is to be pre-stressed, said device comprising:

a. an upper stage comprising:

an upper portion contacting a traction means mounted on one end of said fastener;

an upper piston defining a central bore through which a portion of the fastener passes and comprising a first part forming an upper guide skirt and a second part of larger diameter forming an upper head, and

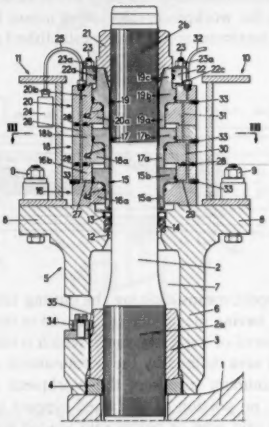
an upper chamber provided with a shoulder encircling said upper guide skirt;

b. at least one intermediate stage comprising an intermediate piston defining a central bore through which a portion of the fastener passes and comprising a first part forming an intermediate guide skirt and a second part of larger diameter forming an intermediate head contacting the upper guide skirt of said upper piston, the thickness of said inter-

mediate guide skirt being less than the thickness of said upper guide skirt; and

an intermediate chamber provided with the shoulder encircling said intermediate guide skirt;

c. a lower stage comprising a lower piston defining a central bore through which a portion of the fastener passes, and comprising a first part forming a lower guide skirt and a second part of larger diameter forming a lower head, and



a lower chamber provided with a shoulder encircling said lower guide skirt; and

d. means for introducing an hydraulic fluid under pressure into said chambers near said shoulders;

whereby the deformations due to the compressive forces of each piston on the next upper piston and to the radial pressure from the hydraulic fluid of the guide skirts of the various pistons are substantially equalized.

4,074,891

WINDING MECHANISM-DRIVE, PARTICULARLY FOR CONSTRUCTION CRANES OR LIKE HOISTING DEVICES

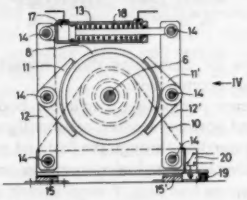
Kaspar Ritter, Kirchheim, Techk, Germany, assignor to KOPAT Gesellschaft fur Konstruktion, Entwicklung und Patentverwertung m.b.H. & Co. KG, Boll Kreis Goppingen, Germany

Filed Dec. 18, 1975, Ser. No. 641,737

Claims priority, application Germany, Dec. 20, 1974, 2460463

Int. Cl.[2] B66D *1/30*

U.S. Cl. 254—150 FH **6 Claims**



1. In a winding mechanism-drive, particularly for construction cranes or like hoisting devices, comprising a rotary current-electromotor, and a hydrostatic transmission with electronic - hydraulic servo-regulation for infinite variations of feeding speeds and feeding moments, the transmission having a hydraulic motor part with a drive shaft operatively connected with a cable drum preferably by means of a mechanical reduction transmission, and a spring force-actuated locking brake for the cable drum automatically electro-hydraulically being released in a balanced condition between load moment and drive moment, the improvement comprising

a locking brake including a quasi- stationary part, said quasi-stationary part being slightly-limitedly pivotally mounted about an axis concentric to the drive shaft of the hydraulic motor part, bearing means concentric with said drive shaft for pivotally mounting said quasi-stationary part,

release circuit means for releasing said locking brake,

an electric switch means electrically connected in said release circuit means and mechanically operatively connected with said quasi-stationary part of said locking brake for actuation of said release circuit means for the automatic release of said locking brake only upon a minimum predetermined pivotal movement of said quasi-stationary part of said locking brake in a direction of lifting.

4,074,892

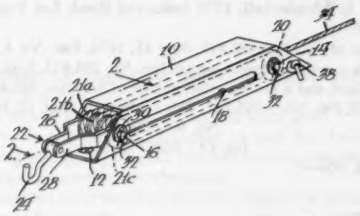
PLURAL BEARING AND SHEAVE ASSEMBLY

Peter O. Harken, Pewaukee, Wis., assignor to Vanguard, Inc., Pewaukee, Wis.

Filed Sept. 20, 1976, Ser. No. 724,327

Int. Cl.[2] B66D *3/04*

U.S. Cl. 254—188 **10 Claims**



1. A plural rotating assembly comprising shaft means, a plurality of rotatable members around said shaft means and being spaced therefrom, ball bearing means associated with each of said rotatable members and providing bearing support between respective rotatable members and said shaft means, said ball bearing means of a first rotatable member being exposed at one side of said member, an adjacent rotatable member at said one side having a surface in bearing contact with the ball bearing means of said first member with said first and adjacent members being otherwise spaced from each other.

10. A method for assembling a plurality of ball bearing supported rotatable members on a shaft comprising the steps of first providing a plurality of rotatable members having an annular body and an axially inwardly projecting circular web on one side thereof defining an open recess with said body, and; second, irrespective of order, placing a set of balls in said open recess and threading said rotatable member on said shaft, and third, threading an additional rotatable member onto said shaft in accordance with said second step with the web of said second member facing the set of balls of said first member.

4,074,893

FENCE

George E. Coltrin, El Monte, Calif., assignor to Adams & Coltrin, Inc., Industry, Calif.

Filed Mar. 8, 1976, Ser. No. 664,824

Int. Cl.[2] E04H *17/16*

U.S. Cl. 256—21 **12 Claims**

1. A fence comprising:

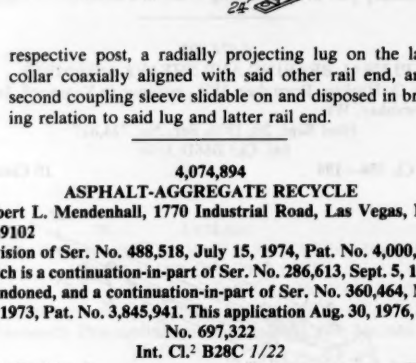
a plurality of upright posts arranged in a row,

a rail extending between each pair of adjacent posts and having a length less than the spacing between the respective posts,

first coupling means connecting one end of each rail to the adjacent post comprising a collar slidable on the respec-

tive post, and a first coupling sleeve on said collar slidably receiving said one rail end in its endwise direction, and

second coupling means connecting the other end of each rail to the adjacent post comprising a collar slidable on the



respective post, a radially projecting lug on the latter collar coaxially aligned with said other rail end, and a second coupling sleeve slidable on and disposed in bridging relation to said lug and latter rail end.

4,074,894

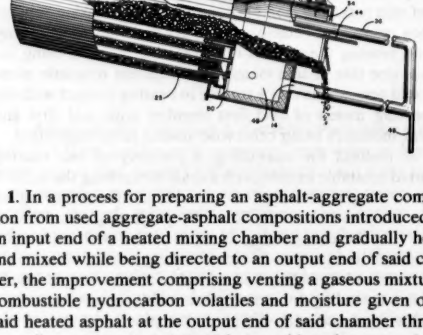
ASPHALT-AGGREGATE RECYCLE

Robert L. Mendenhall, 1770 Industrial Road, Las Vegas, Nev. 89102

Division of Ser. No. 488,518, July 15, 1974, Pat. No. 4,000,000, which is a continuation-in-part of Ser. No. 286,613, Sept. 5, 1972, abandoned, and a continuation-in-part of Ser. No. 360,464, May 15, 1973, Pat. No. 3,845,941. This application Aug. 30, 1976, Ser. No. 697,322

Int. Cl.² B28C *1/22*

U.S. Cl. 366—7 **1 Claim**



1. In a process for preparing an asphalt-aggregate composition from used aggregate-asphalt compositions introduced into an input end of a heated mixing chamber and gradually heated and mixed while being directed to an output end of said chamber, the improvement comprising venting a gaseous mixture of combustible hydrocarbon volatiles and moisture given off by said heated asphalt at the output end of said chamber through a cooling passageway to condense said moisture, removing said condensed moistures from said passageway, and directing said combustible hydrocarbon volatiles into a combustion chamber for heating said mixing chamber.

4,074,895

TORCH AND CUTOFF TABLE ARRANGEMENT

Alfred J. Capriotti, Falls Township, Bucks County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 603,836, Aug. 11, 1975, abandoned. This application Jan. 28, 1977, Ser. No. 763,445

Int. Cl.² B23K *7/00*

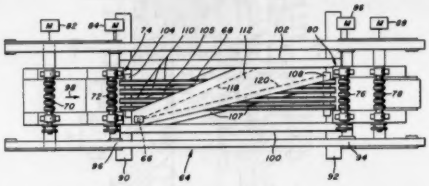
U.S. Cl. 266—50 **12 Claims**

1. A torch and cutoff table arrangement for selectively cutting a workpiece moving in a given direction across the cutting table, the workpiece having a given rate of movement established between a maximum rate and a minimum rate, said cutoff table apparatus including:

means for moving the workpiece toward the cutting table, said moving means having both a minimum and a maximum velocity;

means for removing the workpiece from the cutting table;

means for cutting the workpiece, said cutting means being movable in a direction normal to said given direction and being simultaneously movable at the same rate and direction as the workpiece, the cutting means having an established maximum speed and an established minimum speed; and



fixed support means defining the cutting table, said support means having means defining a void in the support means configured of a size and shape which is substantially equal to that area defined by the permutations of the maximum and minimum speeds of the workpiece and the cutting means, no portion of said fixed support means extending within said void or below said voided area, thereby preventing the cutting of said support means or the build-up thereupon of slag or waste product from the cutting operation.

4,074,896

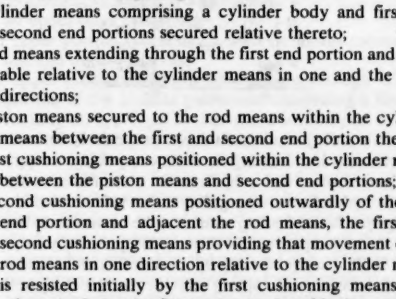
CUSHION COMPRESSION STRUTS FOR BULLDOZER BLADES

Larry G. Eftefield, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 29, 1976, Ser. No. 671,640

Int. Cl.² B60G *11/22*

U.S. Cl. 267—139 **7 Claims**



1. Apparatus for cushioning shock impact to a bulldozer blade or the like, comprising:

cylinder means comprising a cylinder body and first and second end portions secured relative thereto;

rod means extending through the first end portion and movable relative to the cylinder means in one and the other directions;

piston means secured to the rod means within the cylinder means between the first and second end portion thereof;

first cushioning means positioned within the cylinder means between the piston means and second end portions; and

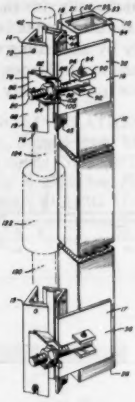
second cushioning means positioned outwardly of the first end portion and adjacent the rod means, the first and second cushioning means providing that movement of the rod means in one direction relative to the cylinder means is resisted initially by the first cushioning means, and subsequently by the first and second cushioning means.

4,074,897

REINFORCING BAR ALIGNER AND CLAMP

Frederick H. Behn, St. Petersburg, Fla., assignor to Construction Innovations, Inc., Rolling Meadows, Ill.

Filed Nov. 4, 1976, Ser. No. 738,879
Int. Cl.[2] B25B *1/20*
U.S. Cl. 269—43 2 Claims



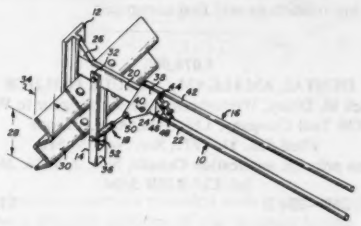
1. A reinforcing bar aligner and clamp for holding reinforcing bars substantially vertical during splicing, comprising: a first clamp adapted for releasable connection to a fixed lower reinforcing bar, said first clamp having a first inner V-jaw, a first outer jaw and a first latch selectively connectable between said first inner V-jaw and said first outer jaw, said first inner V-jaw having a first inner jaw plate and a second inner jaw plate formed integral with and perpendicular to said first inner jaw plate, said first outer jaw being rotatable about a pivot toward and away from said first inner V-jaw, said first inner V-jaw and said first outer jaw each having a first shim pin aperture and a first shim slot, said first latch having a first threaded rod having a first rotatable threaded connector connected thereto which is selectively pivotable into engagement with said first outer jaw to hold said lower reinforcing bar in fixed engagement with said first clamp; a first plurality of elongated rectangular removable shims, each elongated rectangular removable shim of said first plurality having a shim pin fitted into one of said first shim pin apertures and a threaded shim connector fitted to one of said first shim slots; a first pair of rectangular mounting plates rigidly connected to said first clamp; a square cross-section elongated support art rigidly connected to said first pair of rectangular mounting plates at a first end; a second pair of rectangular mounting plates rigidly connected to said square cross-section elongated support arm adjacent a second end of said square cross-section elongated support arm; and a second clamp rigidly connected to said second pair of mounting plates, said second clamp having a second inner V-jaw, a second outer jaw and a second latch selectively connectable between said second inner V-jaw and said second outer jaw, said second inner V-jaw having a first inner jaw plate and a second inner jaw plate formed integral with said perpendicular to said first inner jaw plate, said second outer jaw being rotatable about a second pivot toward and away from said second inner V-jaw, said second inner V-jaw and said second outer jaw each having a second shim pin aperture and a second shim slot, said second latch having a second threaded rod having a second rotatable threaded connector connected thereto which is selectively pivotable into engagement with said second outer jaw to hold an upper reinforcing bar substantially vertical in fixed substantially abutting end-to-end proximity with said lower reinforcing bar, said second clamp being identical to, and collinear with, said first clamp, said second clamp being separated from said first clamp by a center-to-center distance greater than 0.05 of a length of the longer of said upper and lower reinforcing bars; and a second plurality of elongated rectangular removable shims, each elongated rectangular removable shim of said second plurality having a shim pin fitted into one of said second shim pin apertures and a threaded shim connector fitted to one of said second shim slots.

4,074,898

METAL BEAM GUARD RAIL ASSEMBLING CLAMP

Charles G. Samuelson, 1136 Riverside Drive, Rio Dell, Calif. 95562

Filed Mar. 11, 1977, Ser. No. 776,595
Int. Cl.[2] B25B *1/14*
U.S. Cl. 269—228 5 Claims



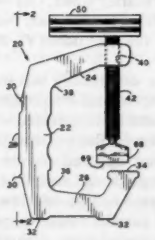
1. A clamp for compressing guard rail sections comprising:
a fixed jaw;
a first handle rigidly attached to said fixed jaw;
a movable jaw pivotally attached to said first handle and facing said fixed jaw, said first and second jaws defining a clamping aperture therebetween;
an elongated lever member pivotally attached at its midpoint to said first handle;
a second handle pivotally attached to one end of said lever member; and
an elongated linkage member having one end pivotally attached to a midpoint of said movable jaw, and its other end pivotally attached to the other end of said lever member, the length of said linkage member and the portion of said lever member extending from its pivotal attachment point to its said other end being selected to provide an overcenter locking means to lock said movable jaw in a predetermined closed position relative to said fixed jaw.

4,074,899

C-CLAMP

Samuel A. Hochstetler, P.O. Box 97, Topeka, Ind. 46571

Continuation of Ser. No. 675,978, April 12, 1976, abandoned. This application May 16, 1977, Ser. No. 797,070
Int. Cl.[2] B23Q *3/00*
U.S. Cl. 269—249 23 Claims



1. A C-clamp comprising:
a C-frame having a base section;
a first jaw extending from one end of the base section and a second jaw extending from the other end of the base

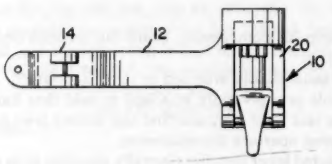
section to define a jaw opening; a first clamp pad affixed to the free end of said first jaw and facing in the general direction of the free end of said second jaw; an elongate pressure screw threadedly mounted in the free end of said second jaw and movable in a longitudinal direction toward and away from said first clamp pad upon threaded rotation of said screw relative to said second jaw; said screw having at one end a polygonal head member having two substantially parallel sides; an elongate handle having a pair of spaced, opposed, parallel walls depending from a base to define a channel-shaped cross-section for slidably receiving said head member; said parallel sides of said head member being in close sliding engagement with the inner surfaces of said walls; said pressure screw having a second clamp pad mounted at the opposite end thereof in facing relation to said first clamp pad.

4,074,900

DENTAL AMALGAM CAPSULE HOLDER

Frederick H. Drury, Winterburn, Canada, assignor to Weatherford Oil Tool Company, Ltd., Edmonton, Canada

Filed Jan. 11, 1977, Ser. No. 758,511
Claims priority, application Canada, Nov. 3, 1976, 264839
Int. Cl.[2] B25B *5/04*
U.S. Cl. 269—254 R **11 Claims**



1. A capsule holder for use on a vibrator comprising a body having first locating means for receiving a first end of a capsule while spring means associated with said locating means maintains an outwards force on said first end of the capsule, said locating means allowing pivotal movement of the capsule during its insertion therein, said body having pivot means displaced from said first locating means and carrying second locating means for the second end of the capsule, said second locating means being pivotable from a first position in which the ends of a capsule may be inserted between said two locating means with little compression of the spring means, through a dead center position in which the ends of the capsule are aligned with said pivot means, and to a second position in which the spring means hold the capsule firmly against the second locating means which latter means are prevented from moving beyond said second position.

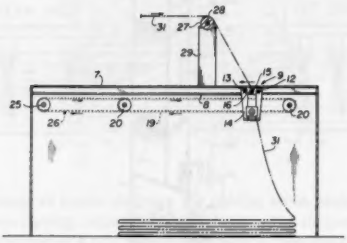
4,074,901

FOLDER FOR WEB MATERIALS

Frank Catallo, 84 Wheatley Road, Old Westbury, N.Y. 11568

Filed Mar. 31, 1977, Ser. No. 783,171
Int. Cl.[2] B65H *45/20*
U.S. Cl. 270—79 **5 Claims**

1. A folder for a continually advancing fabric web and including a pair of horizontal longitudinally extending spaced parallel frame members each provided with a pair of vertically spaced upper and lower flanges, the flanges of one of said frame members being opposed to the flanges of the other thereof, a transverse guide roll assembly pivotally and reciprocably supported at each end by said lower flanges and including a pair of spaced parallel rotatable guide rolls, each of said guide rolls being mounted upon a shaft having each end extending into the space between the upper and lower flanges of its associated frame member, a drive roller affixed to the extending end of each said guide roll shaft and having a diameter to fit with clearance between the said associated upper and lower flanges; means for bodily reciprocating said guide roll assembly along the flanges of said frame members; and means associated with said reciprocating means for oscillating said guide roll assembly in one direction about its said pivotal support during one direction of bodily reciprocation of said guide roll assembly and for oscillating said guide roll assembly in an opposite direction during the opposite direction of bodily reciprocation of said guide roll assembly, whereby to cause said guide rolls to be frictionally driven in the same opposed directions regardless of the direction of bodily reciprocation of said guide roll assembly by alternating contact of said drive rollers with said upper and lower flanges; said means for bodily reciprocating said guide roll assembly and said oscillating



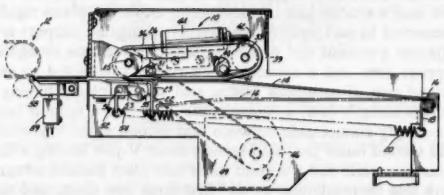
means together comprising a pair of constantly driven endless traverse chains each provided with a laterally projecting stub axle affixed to a link thereof, and a pair of rock yoke and slide connections extending between the shafts of said guide rolls and said stub axles, said rock yokes each being provided with a freely rotatable roller engageable with an associated lower flange for pivotally supporting the associated end of said guide roll assembly, the axes of the shafts of said guide rolls lying in a horizontal plane above that containing the axis of said rock yoke rollers when said rock yokes are in a vertical dead center position, each of said rock yoke rollers being located intermediate the associated shaft rollers and disposed with its lower edge below the lower edges of said shaft rollers.

4,074,902

SHEET FEEDER

Wilburn F. Bradbury, Northbrook, Ill., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed July 23, 1976, Ser. No. 708,053
Int. Cl.[2] B65H *3/04*
U.S. Cl. 271—34 **2 Claims**



1. A sheet feeder, comprising:
a sheet supply support bed;
a sheet separating belt means comprised of two spaced drums and at least one endless belt of high friction characteristics reeved about the drums;
first power means to drive said drums and belt in a direction to move a bottom run of said belt the direction of feed;
a document support bed extending adjacent said bottom run in an angular relationship normally out of document feed contact with said belt;
a retard roller having a one-way clutch, said roller mounted

in contact with said belt between said drums, said clutch permitting rotation only in a counter-feed direction;

a pressure foot positioned within the loop of the belt between the drums with a second power means to press the belt into contact with said bed by distending the belt; and

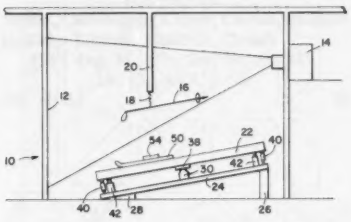
control means for distending the belt prior to full drive of the belt by said first power means to thereby stretch the belt in a reverse drive direction by a small increment prior to the belt drive and thereby increment the retard roller, whereby a fresh retard surface is brought into service with each sheet feed cycle.

4,074,903

SNOW SKIING SIMULATION APPARATUS

Alphonzo Diez de Aux, Suite 4, 1646 Victoria Park Ave., Scarborough, Ontario, Canada (M1R-1P7)

Filed July 8, 1976, Ser. No. 721,273
Int. Cl.[2] A63G *31/16*
U.S. Cl. 272—16 **8 Claims**



1. Snow ski simulation apparatus comprising:

a sloping platform for supporting a skier,

means for projecting an image of a ski slope in front of said platform, and

means connected to said platform for simulating the traverse of the ski slope image projected in front of said platform, said simulation means including means for reciprocably mounting the boots of a skier supported on said platform, said reciprocal mounting means including

a harness for a pair of boots,

a base plate on said platform below each of said harnesses, each of said harnesses including stop means for limiting the reciprocal movement of said harnesses relative to said base plate,

a plurality of ball bearings mounted on each of said base plates, and

means on said boot harnesses reciprocally receiving said ball bearings,

means for rotatably mounting each of said base plates, said base plate rotation mounting means including a ball and socket universal joint, the ball of said joint being connected to said base plate, and the socket being on said platform, said socket being formed in the top of a cylinder, said cylinder including a chamber filled with hydraulic fluid and a fixed piston therein, said cylinder being reciprocal relative to said piston against the force of said fluid.

4,074,904

SWIMMING WORKOUT SUIT

Agostino Arcidiacono, 8838 La Jolla Scenic Drive, La Jolla, Calif. 92037

Filed Oct. 4, 1976, Ser. No. 729,105
Int. Cl.[2] A63B *21/00*
U.S. Cl. 272—116 **2 Claims**

1. A swimming workout suit comprising in combination:

a primary belt shaped surface;

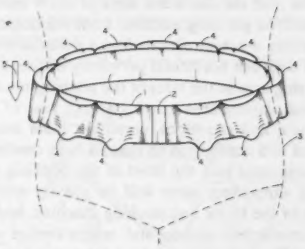
a secondary belt shaped surface substantially of the same width and longer than said primary surface;

said secondary surface flatly joined to said primary surface at selected intervals forming a plurality of open ended substantially semi-cylindrical vanes in a integral structure;

said vanes formed by the outer wall of said primary surface and by the inner wall of said secondary surface;

said vanes disposed around said suit and oriented in the direction of the swimmer motion;

said walls forming a fixed size inlet aperture at one end of said vane and an adjustable size outlet aperture at the other end of said same vane;



said adjustable aperture provided with means to match and adhere selected portions of the terminal border of said secondary surface with that of the primary surface and thereby selectively control the water flow through said vane and the resistance provided by said vane;

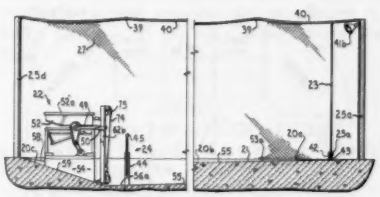
means associated with said belt shaped suit primary surface ends to secure said suit around a swimmer body.

4,074,905

BASEBALL BATTING CAGES

Thaine High, 1810 W. 23rd St., Lawrence, Kans. 66044

Filed July 15, 1976, Ser. No. 705,410
Int. Cl.[2] A63B *69/00*
U.S. Cl. 273—26 D **5 Claims**



1. A limited area batting cage comprising, in combination, a substantially rectangular playing area and surface having a length substantially greater than 61 feet and a width substantially greater than 10 feet,

a home plate zone positioned adjacent one end of the area and also substantially centrally thereof,

a ball pitching machine having an elevated ball storage hopper and a ball throwing arm associated therewith adjacent the other end of the area,

said pitching machine positioned with its throwing arm aligned substantially along the central, longitudinal axis of said rectangular playing area, whereby a ball thrown by the machine moves substantially longitudinally axially of the area and to the center of the home plate zone,

at least the periphery of the said playing area, in its entirety, horizontal and level,

the said rectangular playing area and surface framed by vertical screening at the periphery thereof on all four sides, the rectangular playing area thus having two end wall and two side wall screens,

a ceiling screen roofing the entire enclosed area and surface,

a pitched ball-receiving screen positioned behind home plate,

the playing area and surface being downwardly sloped from the longitudinal sides toward said central longitudinal axis and sloped substantially uniformly from a point well back of the center of the home plate zone to closely adjacent the front of the pitching machine in such manner that a transverse vertical section through the playing area and surface between the home plate zone and pitching machine will give a substantial V-shaped cross-sectional profile with the depth and slope of the V increasing going toward the pitching machine from the home plate zone,

the pitching machine elevated on a pedestal block which is level with the horizontal periphery of the playing area,

the playing area to the sides of the pitching machine and any of said playing area existing to the rear of the pitching machine and the block mounting same being recessed, sloped and configured so that all balls reaching the playing area zone past the front of the pitching machine and block supporting same will be gravity returned to the front of the block and pitching machine, and

an automatic ball pickup and return device positioned in front of the pitching machine for picking up played balls and returning them to the pitching machine ball storage hopper.

4,074,906

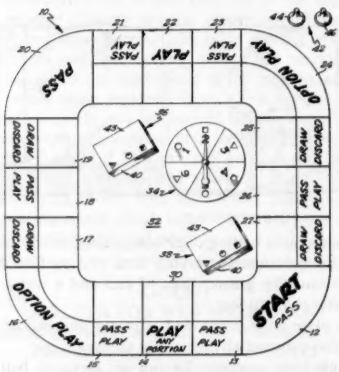
GAME AND APPARATUS

David L. Magiera, Bloomington, Minn., assignor to Wicks & Nemer, P.A., Minneapolis, Minn.

Continuation-in-part of Ser. No. 573,019, April 30, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 718,948

Int. Cl.[2] A63F *3/00, 5/00*

U.S. Cl. 273—243 **21 Claims**



1. Game apparatus for playing by at least two persons comprising, in combination: a plurality of game cards, with the game cards having a first portion and a second portion, with the first portion being separate from the second portion, with the first portion having a first numerical value associated therewith, and with the second portion having a second numerical value associated therewith; means for separately identifying the first portion from the second portion of the game cards; game card playing chance taking apparatus for randomly determining the play of the game cards; and chance taking apparatus for randomly identifying either the first or second portion of the game cards by indicating the corresponding identifying means.

4,074,907

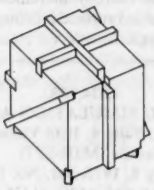
INTERFITTING GAME BOARD AND PLAYING PIECES

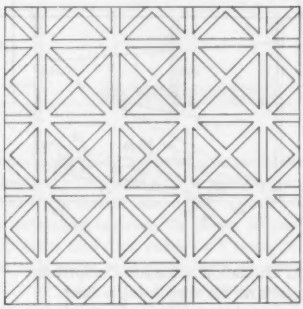
James David Curtis, Santa Rosa, Calif., assignor to James David Curtis, Santa Rosa, Calif.

Filed July 19, 1976, Ser. No. 698,100

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—282 **1 Claim**





1. A game comprising a playing board,

evenly spaced vertical, horizontal and diagonal grooves in said playing board, said diagonal grooves arranged such that they intersect at right angles in the center of squares formed by said vertical and horizontal grooves,

a plurality of identical pairs of cubical playing pieces,

each edge of said cubical playing pieces having a length not greater than the length of the edges of the squares formed by said horizontal and vertical grooves,

a plurality of different patterns of raised strips, each of said patterns being matable with said grooves of said playing board,

each face of said cubical playing pieces having one of said plurality of patterns of raised strips provided thereon.

4,074,908

DOUBLE ACTING DYNAMIC SEAL WITH E-SHAPED SPRING AND L-SHAPED SEALS

Stanley E. Spencer, Palos Verdes Estates, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

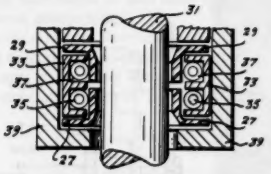
Filed Mar. 9, 1977, Ser. No. 776,039

Int. Cl.[2] B65D *53/00*

U.S. Cl. 277—44 **3 Claims**

1. A double acting dynamic piston seal assembly for use with a cryogenic pump and the like, said seal assembly comprising a seal holder, a piston movable through said seal holder, two L-shaped seals positioned around said piston with their vertical legs adjacent the piston, said L-shaped seals having the free end of each vertical leg adjacent the other and the horizontal legs extending outwardly away from said piston, an E-shaped spring retainer positioned between the outwardly extending horizontal legs of said L-shaped seals and said seal holder, the legs of said E-shaped spring retainer extending inwardly toward said piston and engaging the horizontal legs of said

L-shaped seals, and a pair of wound spring seal expanders positioned between the inwardly extending legs of said E-shaped spring retainer and between the vertical legs of said



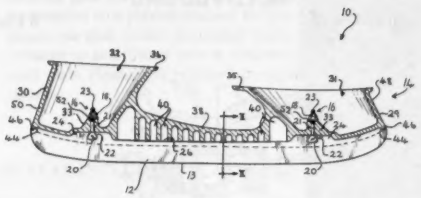
L-shaped seals and the upright portion of said E-shaped spring retainer thereby providing a piston seal assembly capable of sealing under the required high pressure conditions.

4,074,909

ICE SKATE

Hugh E. Baikie, Chateauguay Center, Canada, assignor to Kenbudge Holdings Limited, Montreal, Canada

Filed Aug. 18, 1976, Ser. No. 715,617
Int. Cl.[2] A63C *1/02*
U.S. Cl. 280—11.12 **21 Claims**



1. An ice skate comprising:
a. an elongated blade having an ice-engaging edge and an upper edge opposite the ice-engaging edge;
b. a superstructure made of plastic material for holding the blade, said superstructure defining a groove for receiving said upper edge of the blade;
c. a plurality of bolts for attaching the blade to the superstructure, each bolt having an enlarged head;
d. a plurality of recesses in the blade defined by said upper edge for receiving and retaining said enlarged heads of the bolts;
e. means for retaining said bolts under tension in said superstructure when said upper edge is located in said groove, whereby said blade is firmly held in said groove by said bolts; and
f. wherein the ends of said bolts remote from said heads are threaded, and said retaining means comprise threaded nuts which can be screwed onto said ends and which can be tightened against said superstructure to hold said bolts in place under tension.

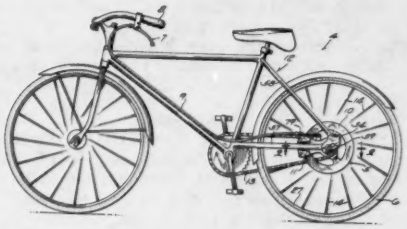
4,074,910

DISC BRAKE APPARATUS SUITABLE FOR BICYCLES

Neil R. Hoffman, Mequon, and Johannes H. Jansen, Milwaukee, both of Wis., assignors to Brake Engineering, Inc., Milwaukee, Wis.

Division of Ser. No. 683,484, May 5, 1976, Pat. No. 4,036,328, which is a division of Ser. No. 606,711, Aug. 21, 1975, Pat. No. 3,985,391. This application Apr. 14, 1977, Ser. No. 787,354
Int. Cl.[2] B62L *1/00*
U.S. Cl. 280—289 R **7 Claims**

1. A disc brake caliper assembly for a wheel of a vehicle such as a bicycle, said wheel being journaled on a non-rotating shaft, and said vehicle having a frame and having cooperating attachment means on its frame and on said shaft, on one end portion thereof, for releasably fixing said shaft in relation to the frame, said caliper assembly being of the type comprising a body that carries a pair of opposing brake pads, one of which can be actuated towards the other against bias to cause the brake pads to clampingly engage a rotor that rotates with the wheel, said caliper assembly being characterized by:
A. a substantially cup-shaped adapter
1. having a hole in its end wall through which said end portion of the shaft can pass with a close fit,
2. the end wall of said adapter having inner and outer surfaces clampingly engageable by said attachment means to confine the adapter against movement relative to the shaft, and
3. the side wall of said adapter having a cylindrical exter-



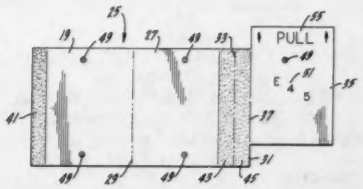
nal surface and having an inside diameter and an axial length such as to be spaced from rotating parts of the wheel adjacent to said attachment means; and
B. the body
1. having a bore near one end thereof in which said adapter is received with a sliding fit, and
2. having near its other end opposing bumpers that extend in directions parallel to the axis of said bore and are spaced apart a distance to snugly embrace a part on said frame so that they can cooperate with said part in confining the body against rotational movement about said adapter while permitting the body to have limited movement in said directions for engagement of both brake pads against the rotor under mutual reaction forces.

4,074,911

TAMPER PROOF LOTTERY TICKET

Charles J. Stipek, Jr., Riverside, Ill., assignor to Bates Printing Specialties, Inc., Cicero, Ill.

Filed May 24, 1976, Ser. No. 689,094
Int. Cl.[2] B42D *15/00*
U.S. Cl. 283—6 **4 Claims**



1. An elongated foldable, one piece paper blank for a ticket usable in a lottery, game of chance and the like, including:
a first panel of rectangular configuration,
a second panel of rectangular configuration connected to one end edge of the first panel by a fold line,
said second panel having substantially the same dimensions as said first panel,
a third panel of rectangular configuration connected to the opposite end edge of said second panel by a fold line,

said third panel having a length less than that of said first or second panels,

a fourth panel of rectangular configuration connected to the opposite end edge of said third panel by an easily breakable interrupted cut line,

said fourth panel having approximately the same width as said first, second and third panels and a length greater than that of said third panel but less than that of either said first and second panels with said fourth panel being offset laterally relative to said first, second and third panels,

said third and fourth panels being foldable about said fold line between said second and third panels to position the third and fourth panels against said second panel with a portion of said fourth panel extending laterally of said second panel,

said first panel being foldable about its fold line with said second panel to extend over said second and said folded third and fourth panels, and

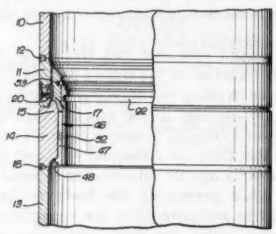
adhesive means permanently fastening said third panel to said second panel and said first panel to said third panel.

4,074,912

RELEASABLE RIGID PILE CONNECTOR APPARATUS

Bernard H. Van Bilderbeek, Ventura, Calif.; John E. Maingot, Houston, Tex., and James M. Walker, Oxnard, Calif., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Sept. 20, 1976, Ser. No. 724,635
Int. Cl.² F16L *37/00*
U.S. Cl. 285—39 **11 Claims**



1. A connector comprising a tubular pin structure, a tubular box structure, one of said structures including first and second sections, means releasably securing said sections to each other, the other of said structures and said first section having abutting transverse surfaces, means for connecting said second section and said other of said structures to each other to apply a compressive preload to said box structure and pin structure, and means for releasing said securing means to permit said second section and said other of said structures to be released from said first section.

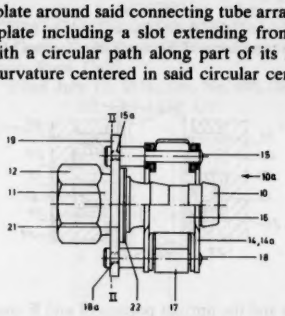
4,074,913

DEVICE FOR RELEASABLE FASTENING OF TUBE OR PIPE ENDS

Karl Weinhold, Im Jagdfeld 43, 4040 Neuss, Germany

Filed May 27, 1976, Ser. No. 690,727
Claims priority, application Germany, May 27, 1975, 2523338
Int. Cl.² F16L *33/12*
U.S. Cl. 285—114 **13 Claims**

1. A device for releasable fastening of tube or pipe ends comprising two shell parts, a pivot bolt connecting said two shell parts at one end of said two shell parts, a locking arrangement for connecting said two shell parts at the other end of said two shell parts, a further pivot bolt hinging said locking arrangement, a connecting tube arrangement associated with said two shell parts and for connection to said tube or pipe end, holding means on said two shell parts for holding said tube or pipe end in connection with said connecting tube arrangement when said locking arrangement is actuated and a mounting plate defining a circular central opening for locating said mounting plate around said connecting tube arrangement, said mounting plate including a slot extending from said central opening with a circular path along part of its length with a radius of curvature centered in said circular central opening,



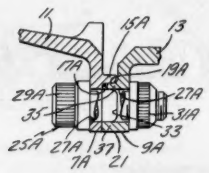
said slot receiving one of said pivot bolts, said mounting plate further including an outwardly open recess in a region opposite to said part of said slot with said circular path and for receiving the other of said pivot bolts.

4,074,914

HIGH PRESSURE LIGHTWEIGHT FLANGES

Rudolph J. Novotny, Stuart, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed July 28, 1975, Ser. No. 599,919
Int. Cl.² F16L *23/00*
U.S. Cl. 285—405 **6 Claims**



1. A flange construction comprising a first member, said first member having a first radially extending annular flange on one end thereof, a second member, said second member having a second radially extending annular flange on one end thereof, said first radially extending annular flange having an annular axially extending outer surface located inwardly from the outer edge of said flange, said second radially extending annular flange having an annular axially extending flange means located radially outwardly of said outer surface, said annular axially extending flange means of said second flange having an annular axially extending inner surface, said outer surface and inner surface being formed to have an interference or "snap" engagement fit, said annular axially extending flange means comprising two axially extending flanges both of which are located radially outwardly of said outer surface, said two axially extending flanges having a length so that the ends of the two axially extending flanges will engage said first flange, means for clamping said first flange to said second flange so that a clamping force extends along a longitudinal line passing through the mating outer surface and inner surface.

4,074,915

SAFETY DOOR LATCH MECHANISM

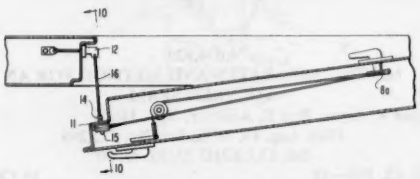
Harry E. Saffer, 219 Allen St., Michigan City, Ind. 46360

Filed Oct. 4, 1976, Ser. No. 728,946
Int. Cl.² E05C *17/36*
U.S. Cl. 292—262 **9 Claims**

1. In a vehicle door assembly having a safety latch mechanism, said assembly comprising a door having inner and outer sides, a frame for said door, hinged means pivotally connecting said door to said frame, latch means comprising an elongated

male element on said frame and having an end portion mating with female elements on said door, manually operable latch release door handle means connected to said female elements to disengage same from said male element on said frame to allow pivotally movement of said door relative to said frame, the improvement comprising:

sleeve mounting means attached to said frame for normally receiving an end portion of said male element distal to said latch means; connecting means extending through said sleeve means and between an end of said male element



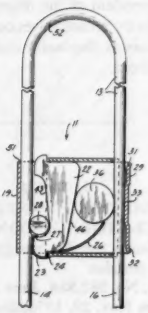
normally received in said sleeve means and said frame for permitting displacement of said male element out of said sleeve means only a predetermined distance; releaseable retaining means carried by said sleeve means and male element for retaining the end portion of said male element therein and for releasing the end of said male element responsive to a predetermined torque applied to said latch means so that under abnormal stress said door will open relative to said frame only a predetermined amount when said male element is released from said sleeve mounting means.

4,074,916

FLAG SEAL INCLUDING FLATTENED SIDE-WALL AND OVAL CABLE

Robert Schindler, Angola, Ind., assignor to Brammall, Inc., Angola, Ind.

Filed Feb. 18, 1976, Ser. No. 658,905
Int. Cl.[2] G09F *3/00*; F16G *11/04*
U.S. Cl. 292—307 R **1 Claim**



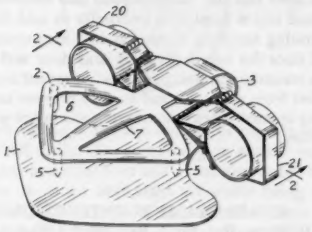
1. A cable lock and seal device comprising a body member formed with an orifice, a cable which has been flattened into an oval cross-section for a substantial length receivable through said orifice, a one way clamping means in said orifice of said body member for preventing said cable from moving relative to said body member, and a portion of said orifice within said body member adjacent said clamping means flattened so as to mate with said flattened portion of said oval cable to prevent it from being twisted or turned, wherein said clamping means comprises a cam member with an inclined surface and a disc which rides on said inclined surface and engages said flattened portion of said oval cross-sectional cable, and spring means urging said disc up said inclined surface, wherein said body member has a second orifice and said cam member has a second inclined surface, and a second disc which rides on said second inclined surface, and wherein one end of said cable in receivable into said second orifice and is locked to said body member by said second disc.

4,074,917

PASTRY SERVING IMPLEMENT

Arthur Federico, 4 Explorer Road, Brigantine, N.J. 08203

Filed Aug. 5, 1976, Ser. No. 712,029
Int. Cl.[2] A47J *43/28*
U.S. Cl. 294—7 **2 Claims**



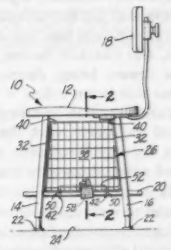
1. A utensil for serving pastry and the like comprising a peel blade adapted to be introduced beneath the pastry for supporting the same and a gripping blade movable relatively to each other about a common axis, substantially U-shaped resilient yielding means integral with the blades tending to bias the blades away from each other, manually actuatable means for manipulating the utensil and linkage interconnecting said manually actuatable means and said blades for moving said blades toward each other in opposition to the bias of said yielding means in response to the actuation of said manually actuatable means, said linkage being responsive to relative movement of said manually actuatable means in substantial parallelism with said common axis, and said manually actuatable means comprise spaced elements movable toward and away from each other relatively to said peel blade to move the gripping blade toward and away from the peel blade.

4,074,918

CHAIR AND DETACHABLE LOCKER

Bernard Kotzin, Jr., 7411 Flight Ave., Los Angeles, Calif. 90045

Filed Mar. 16, 1977, Ser. No. 777,969
Int. Cl.[2] A47C *7/62*
U.S. Cl. 297—192 **5 Claims**



1. In the combination of a chair having four legs which are spaced from one another, a seat supported by the legs, and an article support located beneath said seat of said chair the improvement which comprises:

said article support consisting of an elongated locker having a top, a bottom, two side walls, a closed end, an open end, and a door capable of being manipulated between open

and closed positions located at said open end for providing access to the interior of said locker and for closing off the interior of said locker,

said article support being located beneath said seat and between said legs of said chair so that one of said side walls is adjacent to a set of two of said legs and the other of said side walls is adjacent to a set consisting of the other two of said legs and being located so that said door is accessible,

at least one member secured to said chair and extending between said sets of legs beneath the bottom of said locker,

a locking arm means having first and second ends, said first end being pivotally mounted on said locker remote from said open end and fitting around said member so that said second end is located in proximity to said door, and

cooperating securing means on said arm structure and on said door for use in securing said door and said locking arm means to one another so as to prevent removal of said locker from said chair and so as to prevent said door from being opened when said securing means are secured to one another.

4,074,919

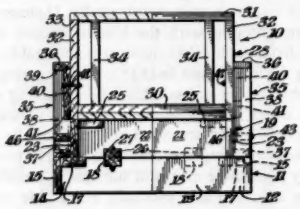
CHAIR FRAME FURNITURE UNIT

William R. Watts, Rte. No. 1, Box 320-1, Millsboro, Del. 19966

Filed Aug. 27, 1975, Ser. No. 608,047

Int. Cl.[2] A47C *15/00*

U.S. Cl. 297—233 **5 Claims**



1. A chair frame unit adaptable to provide sectional furniture comprising;

a. a base of substantial thickness adapted to support a seat section frame, a back frame, and at least one arm frame, and function as legs to provide high rigidity and strength to the unit, said base comprising a front beam, a rear beam, and two side beams arranged in a rectangular array rigidly connected at each of four corners; said base having lower peripheral edges adapted to engage a supporting surface substantially in their entirety;

b. a seat section frame of substantial thickness arranged and adapted to rest upon the base and rigidly and detachably affixed to the base and further adapted to support seat cushioning means, said seat section comprising a front beam, back beam, and two side beams, at least one of the seat section side beams being disposed inwardly with respect to the base side beam below it in an amount sufficient to allow an arm frame to rest atop the base and be in substantial vertical alignment with the side beam of said base while being arranged adjacent to and against the inwardly disposed seat section side beam;

c. a back frame adapted to receive back cushioning means and further adapted to rest on top of said seat section rear beam with the exterior portions of said back frame being in substantial vertical alignment with the exterior portion of the seat section side beams, said back frame comprising a bottom member, a top member, and two side members rigidly connected to each other at their corners to form a rectangular array, said back frame being rigidly and detachably affixed to the seat section frame and an arm frame; and

d. at least one arm frame comprised of a top member, bottom member, and two end members rigidly affixed to each other at corners to provide a rectangular array, said arm frame being adapted and disposed to rest atop the base in substantial vertical alignment with the exterior portion of the side beam of the base located below the arm frame and against the exterior portion of the adjacent side beam of the seat section frame, said arm frame being rigidly and detachably affixed to the seat section frame and the back frame.

4,074,920

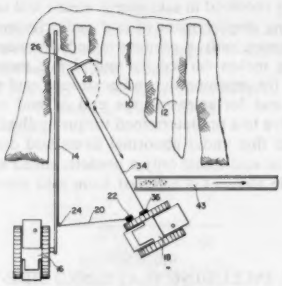
MINING APPARATUS AND METHOD FOR AN AUGERED SEAM

James V. Joyce, Box E, Andover, N.Y. 14806

Filed Aug. 10, 1976, Ser. No. 713,245

Int. Cl.[2] E21C *27/30, 41/00*

U.S. Cl. 299—18 **15 Claims**



13. A method of mining coal or the like comprising inserting first elongated support means into an auger hole in a coal seam, said auger hole having an open end and a blind end, retracting coal recovery means into the auger hole by means of first cable means operatively connected to said first support means, and pulling said coal recovery means out of the auger hole along a path of travel independent of the disposition of said first elongated support means by means of second cable means mounted to second support means disposed outside of said auger hole to recover coal therefrom.

4,074,921

DEVICE FOR EMPTYING WASTE MATERIAL FROM WASTE-STORAGE CONTAINERS

Sergio de Feudis, Nacka, Sweden, assignor to AB Svenska Flaktfabriken, Nacka, Sweden

Continuation of Ser. No. 582,884, June 2, 1975, abandoned. This application Nov. 29, 1976, Ser. No. 745,811

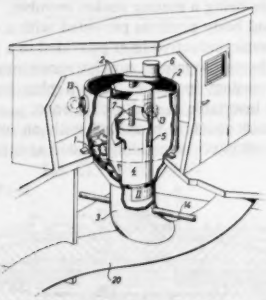
Claims priority, application Sweden, June 5, 1974, 7407391

Int. Cl.[2] B65G *53/14, 53/46*

U.S. Cl. 302—39 **8 Claims**

1. In a system for receiving and collecting solid household waste material and for discharging the solid waste material into a pneumatic conveyor duct the improved construction which comprises a waste-storage container for the solid waste having a vertical side wall portion provided with an outlet port and having a bottom wall portion which is inclined downwardly toward said port; wall means, including said side wall portion and port, forming a valve chamber, said valve chamber having a lower end connected by a branch duct to the pneumatic conveyor duct; a valve body vertically displaceable in said valve chamber between a lower, closed position in which said

port is closed by said valve body and an upper, open position in which said port is open and in which solid waste material in



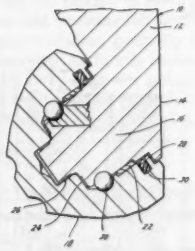
the container passes through the port into the valve chamber and then downwardly into the pneumatic conveyor duct.

4,074,922

DRILL BIT

Henry W. Murdoch, Houston, Tex., assignor to Reed Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 604,264, Aug. 13, 1975, Pat. No. 3,990,751. This application June 11, 1976, Ser. No. 695,505
The portion of the term of this patent subsequent to Nov. 9, 1993, has been disclaimed.
Int. Cl.[2] F16C *19/00*
U.S. Cl. 308—8.2 **10 Claims**



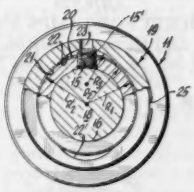
1. A drill bit, comprising
a body having a journal extending therefrom,
a roller cutter,
bearing means for rotatively mounting said roller cutter on said journal,
at least part of said bearing means including
a hard tough metal sleeve having a Rockwell C hardness of at least 35 positioned around said journal within said roller cutter, and
a metal coating on said sleeve having lubricating properties positioned between said sleeve and said journal and between said sleeve and said roller cutter,
said metal coating imparting sufficient lubricity to said sleeve to prevent galling of said roller cutter and said journal.

4,074,923

LOCKING MECHANISM FOR SECURING A BEARING RING OR THE LIKE TO A SHAFT

Ralph S. Howe, Jr., New Britain, Conn., assignor to Textron, Inc., Providence, R.I.

Filed Dec. 20, 1976, Ser. No. 752,835
Int. Cl.[2] F16C *35/06*
U.S. Cl. 308—236 **19 Claims**



1. A unit-handling collar and locking device for locking the collar to a shaft or the like, comprising an annular collar body having a shaft-mounting bore and a threaded radial bore, a set screw in the threaded bore, said set screw being of length exceeding the radial extent of the threaded bore; whereby when said screw is set to clamp said body in assembled relation to a shaft in the shaft-mounting bore, the outer end of said screw projects radially beyond the threaded bore; and a locking ring circumferentially spanning said body and set screw, axial-retaining means coacting between said ring and body for retaining said ring in at least some measure of overlap with said screw, said ring having a cylindrical bore portion sized for rotational support on the radially adjacent region of said body, said last-mentioned bore being locally recessed to radially clear said set screw at a location of angular registry therewith, said ring having a radial tool-access opening externally providing tool access to said set screw when said ring is in said angularly-registered location, and the local recess of the ring bore having a set-screw engageable cam surface for enabling said set screw to ride up to engagement with the cylindrical portion of the ring bore upon relative rotation of said ring and body.

4,074,924

ELECTRICAL CONTACT SYSTEM

Maurice G. N. G. Lebecque, 83-904, Clarke Road, Port Moody, British Columbia, Canada (V3H 1L7)

Filed Oct. 29, 1976, Ser. No. 736,759
Int. Cl.[2] B60L *5/36;* B60M *1/30*
U.S. Cl. 339—20 **11 Claims**

1. An electrical contact system that comprises a power bed consisting of a base plate including at least two electrically conducting layers insulated from each other and a plurality of discrete embossments, formed on the base plate, and arranged in spaced rows, each embossment in each row being spaced from its neighbours in that row by about the same space as between the rows, each embossment being spaced from its neighbours to define with the base plate channels between the embossments;
first electrical contacts at a first part of each channel in electrical contact with a first electrically conducting layer in the base plate channel;
second electrical contacts at a second part of each channel in electrical contact with a second electrically conducting layer in the base plate;
an insulator between the first and second contacts;

means to conduct a supply of electricity to the electrically conducting layers of the base plate; and

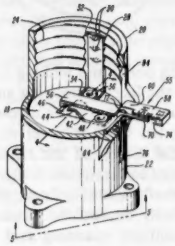
a collector having first electrical contacts to contact said first electrical contacts of the channels and second electrical contacts to contact said second electrical contacts of the channel, said collector being movable along the channels.

4,074,925

SAFETY SOCKET FOR LAMPS AND THE LIKE

Manning I. Rose, 2301 Glenheath, Dayton, Ohio 45440

Filed July 26, 1976, Ser. No. 708,353
Int. Cl.[2] H01R *13/44*
U.S. Cl. 339—44 R **5 Claims**



1. In a safety socket of the type having a housing with wall means defining a load receiving portion having an opening at one end for passage of the base of a light bulb or the like load, a base contact at the bottom of said load receiving portion and confronting said opening for engaging one terminal of said load and a shell contact for engaging a second terminal of said load, and means for connecting one of said base and shell contacts to a source line and the other of said base and shell contacts to a source return line, the improvement wherein said socket further includes:

means defining in said wall means an aperture opening to said load receiving portion;

insulator means supported by said housing near said aperture for movement from a first position in which said insulator means extends through said aperture into said load receiving portion and overlies said one of said contacts to prevent an object extended into said load receiving portion through said opening from engaging said one of said contacts and thereby being electrically connected to said source, to a second position in which said insulator means is ineffective to prevent an object extended through said opening from engaging said one of said contacts;

a reset member at least partially external to said housing for receiving a force independent of the movement of said load applied externally of said housing for moving said insulator means from said first position to said second position; and

load responsive means for moving said insulator means from said second position to said first position upon removal of said load from said load receiving portion.

4,074,926

HIGH VOLTAGE ELECTRICAL CONNECTOR

Roy M. Broad, San Carlos, Calif., assignor to The Scott & Fetzer Company, Cleveland, Ohio

Continuation of Ser. No. 577,065, May 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 470,943, May 17, 1974, abandoned. This application Sept. 27, 1976, Ser. No. 727,136
Int. Cl.[2] H01R *13/52*
U.S. Cl. 339—60 R **6 Claims**

1. A universal electrical connector particularly adaptable for terminus applications of high voltage cables having a central conductor covered by an insulative layer comprising:

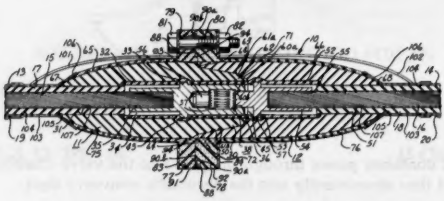
two resilient body portions, one being a plug member and the other being a mating socket member,

each of said body portions provided with a central bore,

an inner semiconductive liner provided in a portion of each of said bores having an annular recess provided therein,

a female contact insertable in said plug bore and a male contact insertable in said socket bore,

each of said contacts provided with an annular shoulder positioned in corresponding of said annular recesses,



said members each provided with two concentric frustoconical mating surfaces, the slant height of the first innermost of such mating surfaces being shorter than the second of such mating surfaces, said first surfaces constituting a nonlocking taper and said second surfaces constituting a holding taper,

an outer resilient semiconductive layer for the full length of said body portions,

a resilient semiconductive perimetral flange integral with its respective outer semiconductive layer, and

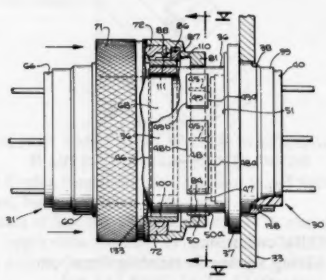
means to releasably secure said flanges together upon interengagement of said plug socket members.

4,074,927

ELECTRICAL CONNECTOR WITH INSERT MEMBER RETAINING MEANS

David J. Ball, Pacific Palisades, Calif., assignor to Automation Industries, Inc., Los Angeles, Calif.

Filed July 26, 1976, Ser. No. 708,477
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—89 M **15 Claims**



1. In an electrical connector having cooperable mating and unmating plug and receptacle means, each provided with an insert member of dielectric material carrying electrical contact elements and axially positioned within a shell with reference to a selected mating relationship, the combination of:

means for retaining at least one of said insert members against axial displacement in one direction including

a compressible insert ring member having external thread means of one configuration;

said one of said shells having internal thread means of a second different configuration;

said ring member being linearly pressure driven in a direc-

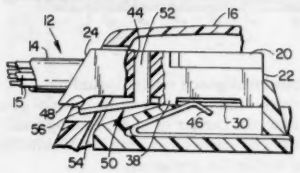
tion opposite to said one direction whereby said external and internal thread means are pressure interlocked at angularly spaced intersections of said external and internal thread means.

4,074,928

ELECTRICAL CONNECTOR HAVING RELEASABLY RETAINED LATCH TAB ASSEMBLY

James J. Johnston, Old Saybrook, Conn., assignor to Automatic Equipment Development Corporation, West Haven, Conn.

Filed Dec. 9, 1976, Ser. No. 749,088
Int. Cl.[2] H01R 13/54
U.S. Cl. 339—91 R 13 Claims



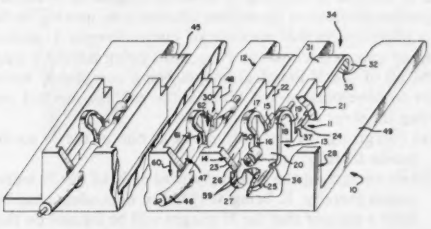
1. A latch tab assembly for replacing a broken latching tab on a plug device of a type which cooperates in plugging relation with a receptacle to electrically connect an elongated flexible conductor attached to the plug device with an internal contacting component within the receptacle, the plug device having a body including a plugging end, the latching tab in its undamaged condition being connected at one end to the body adjacent an associated surface thereof and extending outwardly therefrom in inclined relation to the associated surface and in a direction away from said plugging end for releasably retaining the body in the receptacle, the body having a pair axially parallel and transversely spaced apart holes opening through the associated surface, said latch tab assembly comprising a unitary structure made from resilient plastic material and including a pair of generally parallel mounting posts for respective positioning in the holes, and a retaining tab integrally connected at one end to each of said mounting posts for flexure about an axis of flexure extending generally transversely of said posts, said retaining tab having a free end opposite said one end and extending generally longitudinally outwardly from the associated surface in inclined relation thereto and in a direction of away from the plugging end when said mounting posts are positioned in the holes to retain the latch tab assembly in assembled relation with the plug device.

4,074,929

CABLE CARD EDGE CONNECTOR

Paul Robert Krider, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 29, 1973, Ser. No. 392,728
Int. Cl.[2] H01R 9/08
U.S. Cl. 339—97 R 3 Claims



1. A card edge connector comprising:

a plurality of contact means;

a housing means having a flat bed with a front edge and a rear edge, and constructed to retain said plurality of contact means in a side-by-side parallel relationship with each other in said housing means;

each of said contact means constructed to receive and retain a conductor and comprising:

a U-shaped element with the two legs of the U having a width dimension normal to the plane of the U and with a first slot formed longitudinally in the width dimension of a first of said two legs of the U and a second slot formed longitudinally in the width dimension of the second of said two legs, and further with a slot formed across the trough of said U joining together said first and second slots;

said first slot having a width calculated to cut through the insulation of a conductor inserted therein and to press into the conductive portion of said conductor with sufficient force to make good electrical contact therewith;

said second slot having a width calculated to cut into the insulation only of a conductor inserted therein;

each of said contacts further comprising a strip-like element which extends to the rear edge of said flat bed and is secured at said rear edge to said flat bed;

the said housing means comprises means defining a plurality of first partitions mounted upon said flat bed and positioned between said contact means;

said housing means further comprising a plurality of second partitions substantially perpendicular to the retained conductors and mounted upon said flat bed adjacent said U-shaped element and having a plurality of conductor trapping slots therein, with each conductor trapping slot being substantially aligned with the first and second slots of a given U-shaped element to enable a conductor to be inserted into said first and second slots and also into said conductor trapping slot in substantially parallel directions of motion;

each of said conductor trapping slots having its inner edge formed to facilitate insertion of a conductor therein and to impede the extraction of a conductor therefrom;

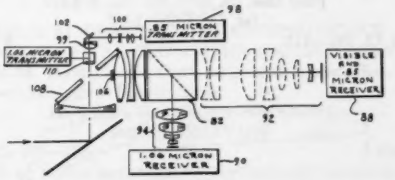
said first slot in each of said U-shaped elements being positioned between said second slot in each of said U-shaped elements and the said conductor trapping locking slot aligned therewith.

4,074,930

COAXIAL OPTICAL SYSTEM

Gary J. Folsom, and Francis J. Kaisler, both of Ellicott City, Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 28, 1976, Ser. No. 652,956
Int. Cl.[2] G02B 27/00
U.S. Cl. 350—33 5 Claims



1. A coaxial optical system for transmitter and receiver optical systems utilizing a common aperture and optical elements comprising: an enclosure; a first image receiving means for receiving radiation of designated wavelengths located along an axis within the enclosure; a second image receiving means for receiving radiation of designated wavelengths different from said first image receiving means located along an axis at an angle thereto, within the enclosure; means for generating radiation compatable with said second image receiving

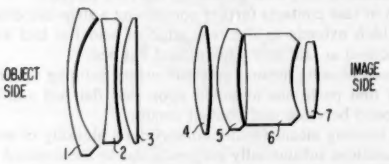
means located along an axis transverse to the axis thereof, within said enclosure; a first lens system including an aperture for collecting radiation and focusing an image at said first image receiving means; means located in said lens system for obscuring an area along the axis thereof; a second lens system including a beam splitting means located along the axis of the second image receiving means and adapted to cooperate with said first lens system whereby radiation transmitted and received utilizes the area of obscuration in the said first lens system.

4,074,931

VARIABLE FOCAL LENGTH LENS SYSTEM

Sadao Okudaira, Ranzan, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1976, Ser. No. 649,383
Claims priority, application Japan, Jan. 18, 1975, 50-8264
Int. Cl.[2] G02B *15/14*
U.S. Cl. 350—184 **3 Claims**



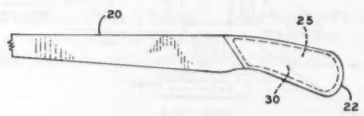
1. A highly efficient variable focal length lens system composed of seven lenses divided in two groups, the first group nearest the object consisting of three lenses forming a negative lens and the second group nearest the image consisting of the remaining four lenses and forming a positive lens, said first group of said lenses including in succession in the direction from the object to the image a first lens L1 in the form of a negative meniscus lens concave to the image side of said lens system, a second negative lens L2 of which both surfaces are concave, and a third lens L3 in the form of a positive double convex lens with the more convex surface directed toward the object, said second group of said lenses including in succession in the direction from the object to the image a fourth lens L4 in the form of a positive double convex lens, a fifth lens L5 in the form of a positive meniscus lens concave to the image, a sixth lens L6 in the form of a thick negative lens, and a seventh lens L7 in the form of a positive lens, the spacing between said first group and said second group being variable.

4,074,932

EYEGLASSES HAVING SHAPEABLE WEIGHTED TEMPLES

William E. Thill, 5151 N. Palm, Suite 410, Fresno, Calif. 93704

Filed Mar. 29, 1976, Ser. No. 671,577
Int. Cl.[2] G02C *5/14*
U.S. Cl. 351—111 **8 Claims**



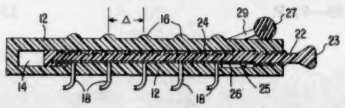
1. In eyeglasses having a pair of ocular pieces; a bridge interconnecting the pieces; and temples rearwardly extended from the ocular pieces, said temples comprising a weighting material, and a relatively lighter material encapsulating the weighting material, the weighting material having a substantially higher specific gravity than the encapsulating material and a melting point above normal atmospheric temperatures and the encapsulating material being ductile at said melting point but substantially rigid at normal atmospheric temperatures.

4,074,933

MICRO INFORMATION INDEXING READER

George J. Yevick, Leonia, N.J., assignor to The Izon Corporation, Stamford, Conn.

Filed Aug. 13, 1976, Ser. No. 714,223
Int. Cl.[2] G03B *21/14*; G02B *27/00*
U.S. Cl. 353—27 R **17 Claims**



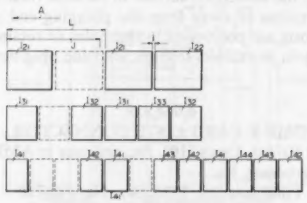
1. A micro intelligence reader including,
a. a relatively thin container being open at one edge for the reception of a carrier of micro intelligence,
b. a microfiche carrier carrying micro intelligence and received within the container,
c. means for directing illuminating light to a plurality of distributed points over the bottom wall of the container to thereby illuminate the micro intelligence,
d. means for indexing the micro intelligence carrier with respect to the container,
e. the top wall of the container carrying projection lenses, light from the illumination directing means passing through the micro intelligence on the microfiche carrier and through the projection lenses and adapted to fall on a projection screen for viewing.

4,074,934

ELECTROSTATOGRAPHIC IMAGING METHOD AND APPARATUS FOR MULTIPLE COPIES

Toyokazu Satomi, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1976, Ser. No. 661,579
Claims priority, application Japan, Mar. 17, 1975, 50-32011
Int. Cl.[2] G03G *15/04*
U.S. Cl. 355—14 **8 Claims**



1. A method of forming N identical images on N identical respective sections of an endless continuously moving surface of a photoconductive member of circumference L utilizing imaging means, each of the N sections being having a length L/N, all of the N identical images being completely formed prior to development and transfer thereof, the method comprising the steps of alternatingly:
(a) energizing the imaging means as one of the N sections passes thereby; and
(b) de-energizing the imaging means as K of the N sections passes thereby, K being selected in dependence on N in such a manner that the N images will be formed on the N sections respectively only once during M movements of the surface of the photoconductive member past the imag-

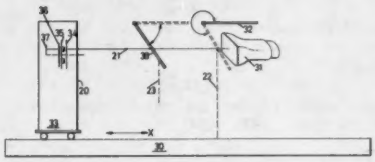
ing means, N, K and M being integers, a value of N being greater than one, whereby after steps (a) and (b) the N identical images are simultaneously developed and transferred a plurality of times.

4,074,935

ALTERNATIVE CAMERA ARRANGEMENT

Harry Arthue Hele Spence-Bate, 115 Cheam Plate, Morley, Australia (6062)

Filed July 14, 1975, Ser. No. 595,867
Claims priority, application Australia, July 17, 1974, 8236/74
Int. Cl.[2] G03B 27/44, 27/76, 27/70, 27/32
U.S. Cl. 355—46 2 Claims



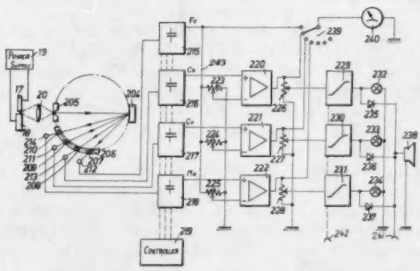
1. An image recording device comprising a camera head including a photographic film, a lens and a shutter; an optical projection means adapted to receive information for transmission to said camera head disposed along the optical axis of said camera head; a horizontally disposed table adapted to hold documents for copying, said camera head and said table fixedly oriented so that the optical axis of the camera head intersects the document axis at a 20° angle; a fully reflecting mirror disposed between said camera head and said projection means at the intersection of said optical axis and said document axis and oriented so as to merge said axes; means to move said mirror along the optical axis of said camera head thereby altering the reduction ratio of said camera; and means to remove said mirror from the optical axis whereby information received by said optical projection means may be transmitted to the camera head for recordation when the mirror is removed from the optical axis and a document image may be transmitted to the camera head for recordation when the mirror is in place in the optical axis.

4,074,936

METHOD AND APPARATUS FOR ANALYZING A COMPOSITION OF AN ALLOY

Ulrich Grisar, and Wilhelm Berstermann, both of Georgsmarienhutte, Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Filed Mar. 10, 1976, Ser. No. 665,774
Claims priority, application Germany, Mar. 26, 1975, 2513266
Int. Cl.[2] G01J 3/36, 3/30
U.S. Cl. 356—81 15 Claims



1. A method of testing an alloy formed of a basis metal and a plurality of alloying elements by comparison with a given test piece, said method comprising the steps of:

generating from said alloy a diffraction spectrum having a basis line corresponding to said basis metal and alloy lines corresponding to each of said alloying elements;

forming a plurality of electrical signals each corresponding to a respective one of said lines and each having a signal level corresponding to the intensity of the respective line;

integrating each of said signals;

simultaneously comparing each of the integrated alloy signals with an adjustable portion of the integrated basis signal and generating a plurality of difference signals; and

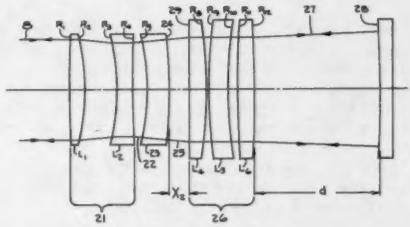
simultaneously evaluating all of said difference signals.

4,074,937

OPTICAL MEASURING DEVICE

Carl A. Zanoni, Middletown, Conn., assignor to Zygo Corporation, Middlefield, Conn.

Filed Feb. 9, 1976, Ser. No. 656,177
Int. Cl.[2] G01B 9/02, 11/26
U.S. Cl. 356—109 3 Claims



1. In an optical measuring device in which a beam of collimated light is decollimated by a decollimating system, is then passed through a partially transmissive, partially reflective, non-refractive spherical reference surface, and the transmitted wavefront is reflected back from a test surface through said reference surface for comparison with the wavefront originally reflected from said reference surface, the improvement which comprises mounting said reference surface in fixed relationship to said decollimating system on the same side of said decollimating system as said test surface, and placing between said reference surface and said test surface a collimating lens system whose distance from the reference surface can be varied to obtain a test wavefront whose radius of curvature can be varied to match the test surface, from diverging for a convave test surface of long radius of curvature, to infinity for a flat test surface, to converging for a convex test surface of long radius of curvature.

4,074,938

OPTICAL DIMENSION MEASURING DEVICE EMPLOYING AN ELONGATED FOCUSED BEAM

Francis M. Taylor, Xenia, Ohio, assignor to Systems Research Laboratories, Inc., Dayton, Ohio

Filed Sept. 27, 1976, Ser. No. 726,991
Int. Cl.[2] G01B 11/10
U.S. Cl. 356—160 3 Claims

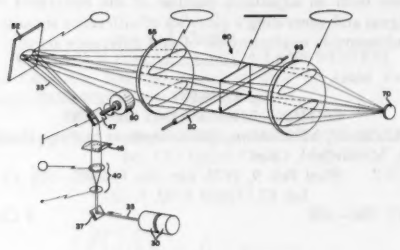
1. In an optical apparatus for continuously measuring the diameter of a cylindrical article moving axially through a zone of measurement of the type including means for generating a beam of collimated light; means, including a mirror, for causing said beam to be scanned repeatedly across the zone of measurement; and photodetector means responsive to the light passing through the zone of measurement and to the scanning means for determining the diameter of the cylindrical article; the improvement comprising

a beam expander positioned between the light generating means and the scanning means for expanding said beam to

a diameter substantially greater than the maximum dimension of any anticipated foreign objects located outside the zone of measurement;

an anamorphic lens for focusing the expanded beam in a first plane on the scanning mirror while leaving said beam in a second, orthogonal, plane collimated;

a first scan lens having the focus on one side thereof on said scanning mirror and the focus on the other side thereof in said zone of measurement whereby said beam in said



second plane is focused to a fine line of light in the zone of measurement while said beam in said first plane is projected through said zone of measurement as an elongated, collimated beam having its long dimension parallel to the cylindrical axis of the article and greater than the size of any anticipated foreign objects both within and without the zone of measurement; and

a second scan lens for collecting the light passing through said zone of measurement and for directing said light onto said photodetector means.

4,074,939

APPARATUS FOR INVESTIGATING FAST CHEMICAL REACTIONS BY OPTICAL DETECTION

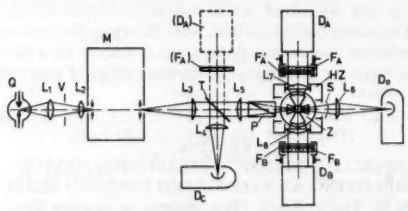
Carl-Roland Rabl, Gottingen, Germany, assignor to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Gottingen, Germany

Division of Ser. No. 487,592, July 11, 1974, Pat. No. 3,972,627. This application May 13, 1976, Ser. No. 686,023

Claims priority, application Germany, Dec. 19, 1973, 2363180

Int. Cl.[2] G01N *21/24*

U.S. Cl. 356—206 **18 Claims**



1. An apparatus for investigating the course of fast chemical reactions by optical detection, said reactions being initiated in chemical system by an external perturbation, said apparatus comprising a sample cell forming a chamber for holding a liquid sample of said chemical system, means performing said perturbation, monochromatic illumination means, at least one light path transversing said sample cell, and opto-electronic detection means including at least two photodetectors operatively connected to a signal processing unit, the improvement wherein said signal processing unit comprises input amplifiers and means for adjusting and balancing of normalized signals, a first main amplifier performing a subtraction of said normalized signals and a second main amplifier performing a summation of said normalized signals, further comprising a divider circuit wherein said first main amplifier is connected to the numerator input and said second main amplifier is connected to the denominator input of said divider, said first main amplifier having at least two selectable gain factors one of which gives a numerator-denominator gain ratio of the order of one and the other one being considerably larger, said unit also comprising means for selecting one output of said main amplifiers and said divider circuit, said selected output being connected to a zero-correction circuit which is electronically controlled by said perturbating means, the output of said zero-correction circuit being connected to signal averaging and recording means.

4,074,940

SAMPLE CELL FOR USE IN THE OPTICAL ANALYSIS OF LIQUIDS

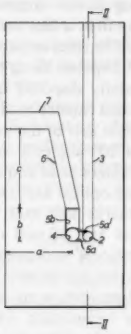
Cecil Sidney Charles Tarbet, Cambridge, England, assignor to Cecil Instruments Manufacturing Limited, Cambridge, England

Filed Mar. 26, 1976, Ser. No. 670,559

Claims priority, application United Kingdom, Mar. 27, 1975, 12980/75; Nov. 7, 1975, 46141/75

Int. Cl.[2] G01N *1/10*

U.S. Cl. 356—246 **12 Claims**



1. A liquid sample cell for discrete sampling which comprises a body formed with internal surfaces defining liquid flow passages, said internal surfaces including portions specifically defining:

a. a generally horizontal sample bore

b. an inlet bore meeting said sample bore at the midpoint of the latter

c. a pair of exit ducts each communicating with a corresponding end of said sample bore

d. a reservoir bore interconnecting said two exit ducts, and

e. a common outlet duct communicating with said exit ducts at respective points located downstream of their connections to said reservoir bore.

4,074,941

CAM OPERATED TOGGLE FOR SECURING A LIGHT FIXTURE OR THE LIKE TO A TUBE

Edward R. Jablonski, South Milwaukee, Wis., assignor to Appleton Electric Company, Chicago, Ill.

Filed July 12, 1976, Ser. No. 704,226

Int. Cl.[2] F16B *21/00*

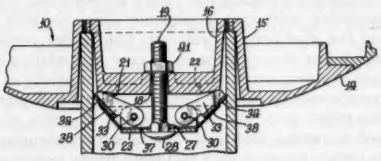
U.S. Cl. 403—260 **1 Claim**

1. In an apparatus for affixing a body to the end of a tube having a uniform cross-section formed about an axis wherein the body includes a hub which extends into the tube from said end and has a distal end within said tube, and said apparatus includes a draw bolt means extending through said hub generally parallel to said axis, said draw bolt means having head means within the tube beyond said hub and means on the opposite side of the hub from said head means to draw said

head means towards said hub, and a device between said hub and said head means for engaging said tube in response to said head means being so drawn towards said hub, the improvement wherein said device comprises:

a rigid support centrally positioned within said tube and extending to opposite sides of said axis, said support being engaged by said head means so that as said head means is drawn toward said hub said support is moved correspondingly, said support being of generally "U" shaped configuration in cross-section and comprising a base and two sides integral with the base, said sides extending from the base towards the hub and at opposite sides of said axis;

a pair of engaging arms each having a distal end and a proximal end, each arm including two sides and an integral connecting plate, the sides of the arm being in juxtaposition to the sides of the base respectively and pivotally connected thereto, the connecting plate extending approximately to the distal end of the arm and having an outer edge at the distal end, the arms being of a length such that the distance between the pivotal connections plus the



length of each arm from the pivotal connection to the distal end of each arm is greater than the inside dimension of the tube normal to the axis in the direction corresponding to the measurement between the pivotal connections, said arms extending upwardly and outwardly to contact the hub and the inside of the tube, whereby as the head of the draw bolt means draws said support towards the hub the hub cams the arms outwardly so that the said outer edges of the plates are forced against the inside of the tube to engage the tube; and

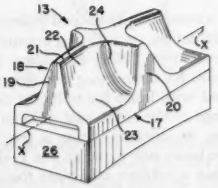
a spring having a base and arms at the respective ends thereof, said spring base being on the side of the support base adjacent the hubs and the spring arms extending at an angle to contact the arm plates respectively to hold the arms against the hub and, prior to the head of the draw bolt means being so drawn, to hold the arms in a position such that the distance between the distal ends of the arms is less than said inside dimension of the tube, the distal ends of the spring arms being closer to said axis than are the distal ends of the engaging arms.

4,074,942

COMPACTOR WHEEL WITH CROSS-SHAPED TIPS

Thomas E. Cochran, Yorkville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 4, 1976, Ser. No. 729,526
Int. Cl.² E01C *19/26*
U.S. Cl. 404—121 **12 Claims**



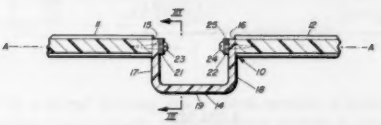
1. A compactor wheel having a plurality of sets of circumferentially and laterally spaced separate tips secured on an uninterrupted periphery thereof, each set of tips being circumferentially aligned about said compactor wheel with a leading edge of a compactor tip of one of said sets being substantially aligned in a transverse direction relative to a trailing edge of a compactor tip of an adjacent set of compactor tips, each tip having a major longitudinal axis extending in a circumferential direction on said wheel and comprising a body portion, and a generally cross-shaped tip portion secured in upstanding relationship on said body portion and including a first tip portion extending in the direction of said axis and a second tip portion, having a length substantially less than the length of said first tip portion, extending transversely relative to said first tip portion and disposed between the ends thereof, outer surfaces formed on each lateral side of said first tip portion disposed on each side of said second tip portion being tapered downwardly and outwardly towards said body portion and means defining a concavity on said outer surfaces below said taper and merging therewith.

4,074,943

WATERPROOF JOINT

Bernard Szugda, P.O. Box 159, Southbridge, Mass. 01550

Filed Nov. 12, 1976, Ser. No. 741,205
Int. Cl.² F16B *1/100*
U.S. Cl. 403—174 **6 Claims**



1. Waterproof joint comprising:

(a) a first elongated waterstop formed of an elastomer material and having a planar end force surface extending at a right angle to the length,

(b) a second elongated waterstop formed of an elastomer material and having a planar surface, the two waterstops being generally in the same plane with the surfaces in parallel, spaced relationship,

(c) a junction member of U-shaped conformation formed of an elastomer material, the junction member having one leg fastened to one end surface and the other leg fastened to the other end surface, and

(d) a metal plate lying along the surface of each leg which is opposite the surface of the leg that lies against the corresponding end surface, there being self-tapping screws extending through the plate and the junction member into the end of the waterstop.

4,074,944

DISPENSING DEVICE

Octavio Marques Xavier, 25206 York Circle, Laguna Hills, Calif. 92653

Filed Nov. 8, 1976, Ser. No. 739,467
Int. Cl.² B43K *5/06*
U.S. Cl. 401—182 **8 Claims**

1. A device for dispensing a fluid material comprising:

a hollow housing, said housing having a chamber therein adapted to contain a supply of the material;

brush bristles connected to said housing;

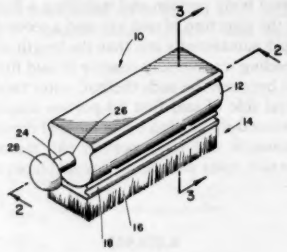
a reciprocal rod within said housing, one end of said rod having an annular cavity therein, said one end having an inwardly extending flange thereon;

a plurality of telescopic cylindrical members adapted to be positioned within said cavity when unexpanded, each of said cylindrical members having a detent on the outer surface thereof, at least the outer member of said cylindrical members having one end with an outwardly extending flange and the other end with an inwardly extending flange;

a piston positioned within said housing, said piston forming

a movable wall of said chamber, said piston adapted to be shifted longitudinally within said housing by reciprocal movement of said rod;

a discharge passage connecting said chamber to said bristles; and



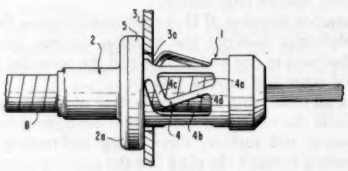
a valve for opening and closing said discharge passage, whereby the fluid material can be selectively dispensed to said bristles.

4,074,945

CABLE FASTENER ASSEMBLY

James R. Kraus, Hagerstown, Md., and Howard C. Murphy, Williamsport, Pa., assignors to Pennsylvania Wire Rope Corporation, Williamsport, Pa.

Filed May 6, 1976, Ser. No. 683,789
Int. Cl.[2] F16B 9/00
U.S. Cl. 403—197 **5 Claims**



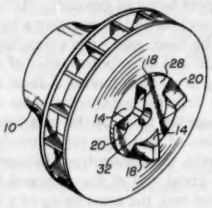
1. A cable fastener for mounting a sheathed cable extending through an aperture in a wall comprising, a latch clip adapted to be positioned on one side of said wall, a collar adapted to be positioned on the opposite side of the wall, one end of said latch clip being connected to said collar, said latch clip having a substantially cylindrical body portion and resilient finger means integrally connected thereto, said resilient finger means each having diverging portions extending tangentially to the latch clip body portion and inclined toward opposite end planes of said cylindrical body so that when inserting the fastener in a wall aperture the peripheral edge of the wall aperture progressively engages certain inclined portions of the resilient finger means causing the finger means to be cammed radially inwardly circumferentially around the cylindrical body portion until other inclined portions of the resilient finger means pass through said aperture whereupon the resilient finger means spring radially outwardly causing said other inclined portions of the resilient finger means to engage the peripheral edge of the wall aperture to secure the fastener within said aperture, whereby the fastener assembly is adapted for mounting in walls of various thicknesses and is prevented from rotating within the wall aperture.

4,074,946

SHAFT-ROTOR COUPLING

Judson S. Swearingen, 2235 Carmelina Ave., Los Angeles, Calif. 90064

Filed July 28, 1976, Ser. No. 709,382
Int. Cl.[2] B25G 3/02
U.S. Cl. 403—364 **11 Claims**



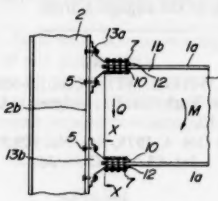
1. A coupling for joining two rotary elements and aligning and maintaining their axes in accurate alignment with each other and the joint between elements tight under conditions under which one element expands or contracts relative to the other, said coupling comprising a plurality of axially extending, circumferentially spaced teeth on one of said elements facing the other, three mating recesses on the other element positioned to receive said teeth, and means for securing said elements tightly together with said teeth firmly seated in said recesses, said teeth being in the form of wedges directed axially with plane tangentially exposed wedge zooming surfaces, each such wedge forming surfaces and each recess surface coacting therewith having its elements parallel to a single radial line perpendicular to said axis, and a pair of mutually adjacent plane surfaces on the same element being oppositely inclined relative to the axis.

4,074,947

FITTINGS FOR CONNECTING COLUMNS AND BEAMS

Naomasa Matake; Tadayoshi Yoshimura, both of Kitakyushu, and Kuniaki Sato, Hiratsuka, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

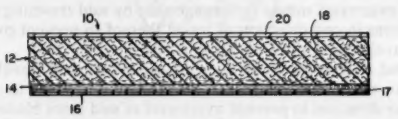
Filed Aug. 5, 1975, Ser. No. 602,099
Claims priority, application Japan, Aug. 12, 1974, 49-91572; Aug. 12, 1974, 49-91573; Jan. 24, 1975, 50-9707
Int. Cl.[2] F16B 7/18
U.S. Cl. 403—406 **9 Claims**



1. Fittings for connecting H-shaped beams and columns of a steel frame construction, each fitting comprising an L-shaped outer fitting member including a column side plate formed with holes for bolts for connecting it to the column and a beam side plate formed with holes for bolts for connecting it to an outside of a flange of the beam, said column side plate successively increasing its thickness from a free end to a portion connected to the beam side plate; and an L-shaped inner fitting member including a column side plate formed with holes for bolts for connecting it to the column and a beam side plate formed with holes for bolts for connecting it to an inside of said flange of the beam, said column side plate successively increasing its thickness from a free end to a portion connected to the beam side plate, thereby embracing said flange of said beam

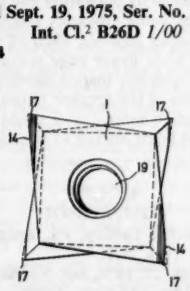
between said beam side plates of said outer and inner fitting members.

4,074,948
PAVEMENT MAT AND PROCESS
Guy C. Heater, Jr., 4 Suydam Drive, Melville, N.Y. 11746
Filed May 7, 1976, Ser. No. 684,275
Int. Cl.[2] E01C *5/22*
U.S. Cl. 404—75 **7 Claims**



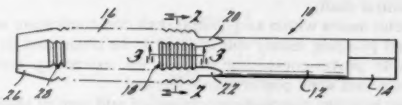
4. A process for the surfacing of a pavement comprising delivering a plurality of adhesive backed pavement mats on a first vehicle to a road surface, said road surface selected from at least one member of the group consisting of bituminous, concrete and metal surfaces, said plurality of mats being stacked one on top of the other, bottom surface to wear surface placing one end of the top mat in said plurality on said road surface so that said adhesive back is in contact with said road and securing said end so placed by a second wheeled vehicle, said second wheeled vehicle being sufficiently heavy to bond said adhesive back to said road when said second vehicle is wheeled over said mat, moving said first vehicle forward until said mat is pulled off of said first vehicle, wheeling said second vehicle over said mat to bond said mat to said road surface, repeating said process until each mat of said plurality is applied to said road, said pavement mat comprising a fibrous mat impregnated with a mixture of bituminous material and aggregate, said mat having a wear surface and bottom surface, a bituminous adhesive layer extending along said bottom surface, a particulate inorganic release coating on said adhesive layer for preventing said mats from adhering to one another when stacked one on top of the other, bottom surface to wear surface, said release coating being forced into said adhesive surface by pressure applied to said wear surface when said mat is in place on a road surface.

4,074,949
CUTTING TOOL
Walter Hochmuth, Nuremberg, and Hans Peter Hollfelder, Furth, Bay, both of Germany, assignors to Robert Zapp, Werkzeug-und Maschinenfabrik GmbH, Stuttgart, Germany
Filed Sept. 19, 1975, Ser. No. 615,073
Int. Cl.[2] B26D *1/00*
U.S. Cl. 407—114 **12 Claims**



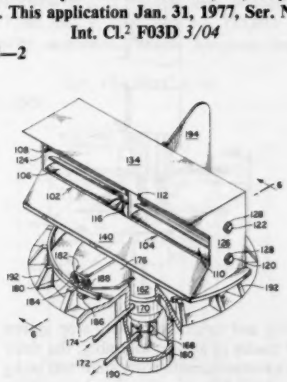
1. A cutting tool arrangement for metal cutting comprising, in combination, a base body having parallel base surfaces and grooves machined into the side surfaces for forming cutting edges, said cutting tool being insertable into recesses of a tool holder and having a center bore; said base body having rhombic-shaped cross-sections parallel to said base surfaces and having V-shaped sides formed by relief surfaces intersecting in a line between said parallel base surfaces, said parallel base surfaces of said base body being rhombic-shaped with vertices, said line extending along one side of said base body, said line extending from one vertex of one parallel base surface to a predetermined vertex on the opposite parallel base surface, said predetermined vertex lying diagonally opposite said one vertex, said predetermined vertex lying also opposite a vertex on said one base surface adjacent to said one vertex, said line extending along one side intersecting at both ends with lines on adjacent sides, said lines being interconnected in sequence and forming a rhombus in a plane inclined to the planes of said parallel base surfaces, said lines forming base edges of said grooves.

4,074,950
LOCKING THREAD FORMING TAP
Horace D. Holmes, 28576 Green Willow, Farmington Hills, Mich. 48024
Filed Oct. 4, 1976, Ser. No. 729,207
Int. Cl.[2] B23G *5/06*
U.S. Cl. 408—220 **2 Claims**



1. In a thread forming tap, a shank section, a body section extending longitudinally from the shank section having axially disposed grooves therein, a helical thread on the body section having dissimilar angularly disposed flanks extending from a pilot portion to a final thread-cutting portion representing the final configuration of the thread to be formed by said tap, one said flank in said final thread cutting portion lying at an angle relative to the longitudinal axis of the tap which is substantially greater than 35°, the opposing flank facing the shank section in said final thread-cutting portion forming a ramp of substantially less slope than that of said first flank and being arranged at an angle of approximately 25° - 35° relative to the axis of said tap.

4,074,951
WIND POWER CONVERTER
Gerald E. Hudson, 229 15th St. West, Billings, Mont. 59102
Continuation-in-part of Ser. No. 576,189, May 9, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 764,397
Int. Cl.[2] F03D *3/04*
U.S. Cl. 415—2 **10 Claims**



1. A wind power converter comprising:
a pair of rotatable turbines with elongated blades disposed within a rotatable housing on axially parallel shafts, the curvature of the blades of one turbine being opposite to

the curvature of the blades of the second turbine so that wind passing between said turbines will rotate the turbines in opposite directions;

said housing including shaft-supporting sections at the ends of said turbines, lateral sections connecting said end sections, a pair of wind deflectors disposed between said end sections and extending from adjacent edges of said lateral sections toward the midpoint between said turbines and terminating approximately the same distance from each other as the distance between said turbine shafts, and a pivotally mounted vertically disposed vane extending from a portion of said housing opposite to said wind deflectors;

said rotatable housing being supported on a vertically disposed central shaft and on a plurality of beams radiating from said central shaft with the free end of each beam having at least one pair of flanged wheels engaging a peripheral annular track with one wheel of each pair in contact with the top of said track and the other wheel of each pair in contact with the bottom of said track;

means for synchronizing the rotation of said turbines;

fluid pumping means operatively connected to said turbines mounted on said rotatable housing adjacent the top of said central shaft;

conduit means within said central shaft communicating with said pumping means and adapted to be connected to remote power-consuming devices for extracting power from said wind power converter; and

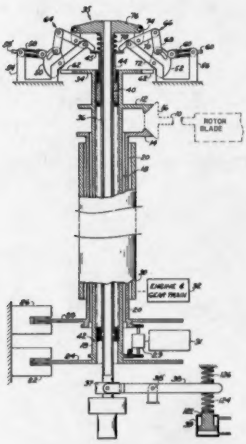
thrust bearings disposed on portions of said central shaft.

4,074,952

LOCKING CONTROL AND OVERTRAVEL SAFETY STOP SYSTEM FOR VARIABLE LENGTH ROTOR BLADES

Evan A. Fradenburgh, Fairfield, and Jay M. Yarm, Milford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed June 28, 1976, Ser. No. 700,455
Int. Cl.² B64C *11/28*
U.S. Cl. 416—87 **14 Claims**



1. A locking and overtravel safety stop system for variable length rotor blades of a rotor assembly, the rotor blades being mounted on a rotatable main rotor shaft and being adjustable in length upon actuation of adjusting means for changing the length of the rotor blades, the locking system including:

a rotatable extension shaft coaxial with said main rotor shaft and coupled to said adjusting means;

a rotatable retraction shaft coaxial with said main rotor shaft and coupled to said adjusting means;

A lock shaft coaxial with said extension and retraction shafts, said lock shaft being rotatable and translatable;

locking means operable in response to translation of said lock shaft to a locking position to lock said adjusting means relative to said rotor assembly;

actuating means for selectively translating said lock shaft;

traveling nut means mounted on one of said extension or retraction shafts for translational movement along said one shaft commensurate with length adjustments of said rotor blades as a function of relative rotation between said one shaft and the main rotor shaft;

first overtravel means for engagement by said traveling nut means in one direction of travel thereof to prevent overtravel of said rotor blades in a first direction; and

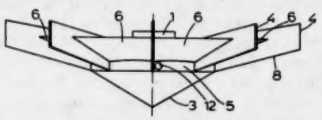
second overtravel means for engagement by said traveling nut means in a direction of travel thereof opposite to said one direction to prevent overtravel of said rotor blades in a second direction.

4,074,953

SURFACE AERATOR

Antonius Wilhelmus Hermanus Budde, Ermelo, and Johannes Bernardus Maria Wiggers, Hoevelaken, both of Netherlands, assignors to Ingenieursbureau Dwars, Heederik en Verhey B.V., Amersfoort, Netherlands

Filed Nov. 2, 1976, Ser. No. 738,174
Claims priority, application Netherlands, May 31, 1976, 7605875
Int. Cl.² B01F *3/04*
U.S. Cl. 416—183 **8 Claims**



1. A surface aerator apparatus employing a central vertical shaft coupled to drive means; substantially vertical blades being mounted on a lower end of the shaft; an upwardly expanding, smooth conically shaped member disposed underneath, and coaxially with, said shaft; wherein: said conically shaped member having its greatest radius appreciably greater than the radius of said shaft, but appreciably smaller than the radius of said apparatus at outside edges of said blades, said conically shaped member being further defined at an upper edge by an adjoining overhead vertical cylinder; said blades being successively linked by outwardly and upwardly inclined flat connecting plates, being upwardly staggered with respect to said conically shaped member; each of said blades being fitted to said shaft, while lower edge portions of said blades located outside said conically shaped member being proximate thereto at the location of the greatest radius thereof; and said plates being disposed to extend both inside and outside said vertical cylinder and being affixed to said cylinder.

4,074,954

COMPRESSOR

William Walter Roberts, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 27, 1976, Ser. No. 662,183
Int. Cl.² F04C *19/00*
U.S. Cl. 418—68 **16 Claims**

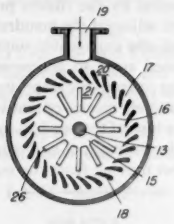
1. A compressor which comprises:

(i) a casing,

(ii) a rotor journalled for rotation inside the casing,

(iii) a gill ring comprising a plurality of closely spaced stationary vanes positioned around the periphery of the rotor for directing incoming fluid to be compressed into a rotating annulus of working fluid within the gill ring for entrainment in the ring of working fluid,

(iv) a fluid inlet communicating with the space outside the gill ring, and



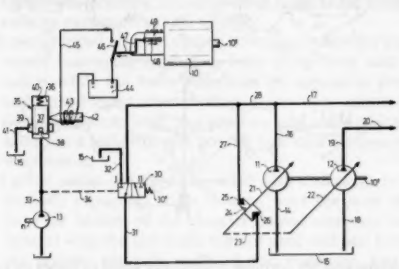
(v) a fluid outlet communicating with the space inside the gill ring.

4,074,955

PUMPING ARRANGEMENT CONTROL DEVICE

Gerhard Nonnemacher, Korntal; Emil Knodel, Stuttgart; Walter Robeller, Boblingen, and Paul Bosch, Ludwigsburg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 9, 1976, Ser. No. 656,582
Claims priority, application Germany, Feb. 12, 1975, 2505779
Int. Cl.[2] F04B *49/00, 1/26;* F16B *31/02*
U.S. Cl. 417—218 **20 Claims**



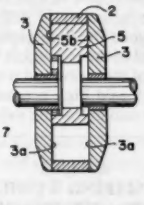
1. In an arrangement for pumping fluids, a combination comprising pumping means for pumping a fluid at a variable output rate, including at least one variable-output pump having an adjusting element adapted to control the output rate of said pump; adjusting means for adjusting the output rate of said pumping means, including displacing means for displacing said adjusting element between low-output and high-output positions thereof; driving means for driving said pumping means at varying speeds; first generating means for generating a first signal indicative of power input to said driving means; second generating means for generating a second signal proportionate to the speed of said driving means, including an auxiliary pump driven by said driving means and operative for discharging control fluid at a rate proportionate to the speed of said driving means, a discharge conduit communicating with said auxiliary pump, and a throttle valve in said discharge conduit having a valve housing and a valve member mounted in said valve housing for displacement between an extended and a retracted position through a plurality of intermediate positions in which said throttle valve has different flow-through cross-sectional areas for passage of the control fluid therethrough, biasing means urging said valve member toward said extended position thereof, and means for admitting the control fluid in said discharge conduit upstream of said throttle valve to the latter to act on said valve member against the action of said biasing means; and control means for controlling said adjusting means in dependence on said first and second signals, including arresting means for arresting said valve member in any of said positions thereof when said first signal reaches a predetermined value to thereby change the proportionality characteristic of said second generating means by maintaining the respective flow-through cross-sectional area of said throttle valve, and a control slide displaceable between a first position in which said displacing means displaces said adjusting element toward said low-output position and a second position in which said displacing means displaces said adjusting element toward said high-output position, said control slide being responsive to changes in said second signal.

4,074,956

SULPHUR AND NITROGEN TREATED IRON BASED ROTOR FOR ROTARY PISTON ENGINE

Masayuki Maruyama, Kashiwazaki; Yoshitugu Hamada, and Ryoichi Yamauchi, both of Nagahama, all of Japan, assignors to Riken Piston Ring Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 9, 1976, Ser. No. 694,450
Claims priority, application Japan, Nov. 29, 1975, 50-142629
Int. Cl.[2] F01C *21/00*
U.S. Cl. 418—178 **6 Claims**



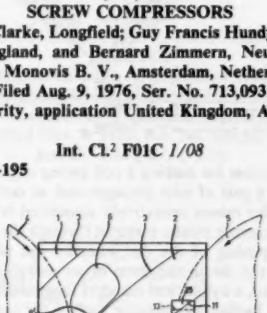
1. A rotary piston engine comprising a casing which includes a center housing and a pair of side housings secured to the opposite sides of the center housing, and a rotor disposed in said casing for rotation, said side housings being made of high silicon aluminum alloy, said rotor being made of iron based material and having opposite side surfaces which are arranged to face the inside surfaces of the side housings, said rotor having surface layers rich in sulphur and nitrogen on the side surfaces thereof.

4,074,957

SCREW COMPRESSORS

Robert John Clarke, Longfield; Guy Francis Hundy, Gravesend, both of England, and Bernard Zimmern, Neuilly, France, assignors to Monovis B. V., Amsterdam, Netherlands

Filed Aug. 9, 1976, Ser. No. 713,093
Claims priority, application United Kingdom, Aug. 21, 1975, 34749/75
Int. Cl.[2] F01C *1/08*
U.S. Cl. 418—195 **1 Claim**



1. Positive displacement rotary machine comprising a screw rotatable about an axis and having surface grooves formed

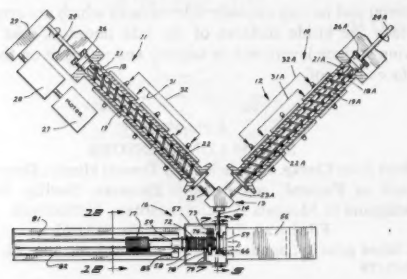
therein which are inclined relative to that axis, the lands, serving to separate the grooves one from another, making sealing engagement with a surrounding casing whereby each groove defines, during at least a part of the rotation of the screw within the casing, a chamber, at least one gate rotor having teeth which intermesh with the grooves of the screw, each tooth being successively in sealing relationship with a groove as the intermeshing screw/rotor(s) rotate, the volume of any chamber defined by a groove and limited by a rotor tooth changing from a maximum to a minimum as the screw and rotor(s) rotate, at least a high pressure port in the casing adjacent to a high pressure end of the screw and communicating with each chamber when the volume thereof is at, or adjacent to, its minimum volume and at least a low pressure port at the low pressure end of the screw, characterized in that an unloading valve is disposed in the casing in spaced relation to the gaterotor in the high pressure side of said casing, said valve including a valve port which extends beyond the high pressure end of the screw, such high pressure end being in sealing contact with a radially extending portion of the casing, the port being provided with a movable closure member which in one limiting position obturates the one end of said valve port remote from the high pressure end of the screw while leaving a region of said valve port open at said high pressure end and connected to said high pressure port end, and in another limiting position passes beyond the high pressure end of the screw and leaves open the end of the valve port which is remote from the high pressure end of the screw and is connected by ducts to said low pressure port, said high pressure port in the casing being located between said unloading valve and said gaterotor.

4,074,958

APPARATUS FOR MAKING A COIL SPRING OBJECT

Lester V. Molenaar, Box 777, West Highway 40, Willmar, Minn. 56201

Filed Oct. 8, 1976, Ser. No. 730,801
Int. Cl.[2] B29C *17/00*
U.S. Cl. 425—71 **27 Claims**



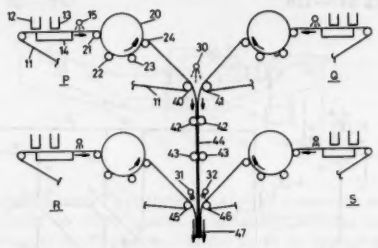
1. An apparatus for making a coil spring object comprising: a die having a pair of inlet passages and an outlet opening, a pair of extruder means operatively associated with the die for heating and moving plastic material through the inlet passages and outlet opening of the die whereby the plastic material moves from the die in the form of an elongated continuous ribbon product, a cylindrical mandrel located adjacent the die, said mandrel having a first outer surface for carrying the ribbon product as it is moved from the die, means connected to said mandrel for rotating the mandrel, means operatively associated with said mandrel for cooling the ribbon product carried by the mandrel, a stationary head having an annular collar surrounding the mandrel at said first outer surface, a separator surrounding the mandrel adjacent the head wherein ribbon product is carried on the first outer surface of the mandrel between the separator and the annular collar of the stationary head as it is moved from the die, said separator having spaced edges defining a radially outwardly directed slot providing a passage open to the mandrel for accommodating the ribbon product moved in a circular path by the rotating mandrel, said mandrel having a second outer surface on the side of the separator opposite the stationary head for receipt of ribbon product moved from the separator, said second outer surface having a diameter less than that of the first center surface to prevent binding on the mandrel by the ribbon product as it cools, a spacer wheel located adjacent the mandrel, said wheel having a plurality of spaced ribs engageable with the mandrel, adjacent ribs being spaced apart to accommodate a turn of the product, roller means operatively associated with said mandrel for holding the mandrel, means operatively associated with said mandrel to cut a turn of the product to form the coil spring object, and means downstream of said mandrel for supporting the coil spring object moving from the mandrel.

4,074,959

APPARATUS FOR FORMING MULTI-PLY FIBROUS SHEETS

Harold George Curry, Hambrook; Brian William Attwood, Hanham near Bristol, and Derek Graham Walter White, Bristol, all of England, assignors to Karl Kroyer St. Anne's Limited, Bristol, England

Continuation of Ser. No. 489,053, July 16, 1974, abandoned, which is a division of Ser. No. 390,244, Aug. 21, 1973, Pat. No. 3,905,864. This application Sept. 30, 1976, Ser. No. 728,282
Claims priority, application United Kingdom, Sept. 9, 1972, 41960/72
Int. Cl.[2] B29J *5/00*
U.S. Cl. 425—81.1 **3 Claims**



1. Apparatus for forming a multi-ply sheet of paper or paperboard comprising:

means for dry-laying a first web including essentially cellulosic fibers by depositing dry fibers in an air stream onto a movable forming surface,

means for applying adhesive or binder to the said dry fibers of the first web, means for adding water to the first web to moisten the same to permit consolidation thereof, means including a pair of rolls defining therebetween a press nip through which the first web passes for simultaneously heating the web to a temperature of at least 150° F and pressing the web to a pressure of at least 50 pounds per square inch, whereby the combination of heat, moisture, binder and pressure cause the first web to consolidate by activation of the adhesive or binder into a consolidated self-sustaining sheet of paper or paperboard,

means for dry-laying a second web including essentially cellulosic fibers by depositing dry fibers in an air stream onto a movable forming surface,

means for applying adhesive or binder to the said dry fibers of the second web, means for adding water to the second web to moisten the same to permit consolidation thereof, means including a pair of rolls defining therebetween a press nip through which the second web passes for simultaneously heating the web to a temperature of at least 150° F and pressing the web to a pressure of at least 50 pounds per square inch, whereby the combination of heat, moisture, binder and pressure cause the second web to consolidate by activation of the adhesive or binder into a consolidated self-sustaining sheet of paper or paperboard,

and means for combining the consolidated self-sustaining first web and the consolidated self-sustaining second web to form a multi-ply sheet of paper or paperboard.

4,074,960

MANUFACTURE OF POLYMERIC FOAM

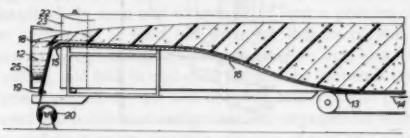
Edward Dockray, Holcombe Brook, and Denis Killen, New Mills, both of England, assignors to Unifoam A.G., Glarus, Switzerland

Filed Nov. 1, 1976, Ser. No. 737,402

Claims priority, application United Kingdom, Nov. 7, 1975, 46274/75

Int. Cl.[2] B29D *27/00*

U.S. Cl. 425—89 **21 Claims**



1. Apparatus for producing a continuous strand of polymeric foam from a mixture of liquid foam reactants, comprising

(a) a trough in which the liquid foam reactants may expand upwardly;

(b) means operatively assrested with said trough for supplying liquid foam reactants to the bottom of said trough;

(c) weir means arranged adjacent the upper portion of said trough for receicing in overflowing relation the foam that rises by expansion in said trough;

(d) open-topped channel shaped conveyor means for continuously conveying expanding foam away from said weir means while the foam completes its expansion process, said open-topped channel shaped conveyor means comprising a bottom wall, and separate side walls which join and form a seal with said bottom wall downstream of the weir means;

(e) guide means operably associated with the trough to keep partially expanding foam flowing over the weir means onto the bottom of the channel shaped conveyor out of contact with the side walls thereof until said seal between the bottom and side walls of said conveyor has been formed; and

(f) conveyor width adjustment means operable to alter the width of the bottom of the channel shaped conveyor and to move its side walls correspondingly in synchronism with width alterations of said bottom while still maintaining the seal between the bottom and side walls of the channel shaped conveyor during width changes, whereby foam of varying widths may be produced without stopping the production run.

4,074,961

APPARATUS FOR PRODUCING CONTAINERS

Wilhelm Reil, Bensheim-Auerbach, Germany, assignor to Altstadter Verpackungs-Vertriebs GmbH, Pfungstadt, Germany

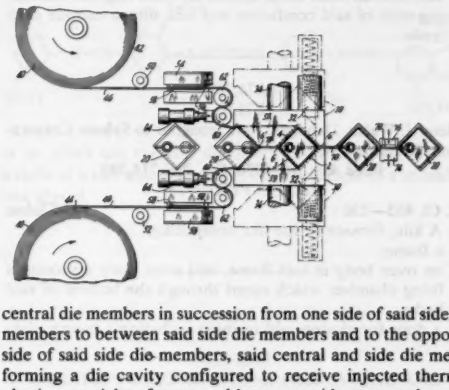
Continuation-in-part of Ser. No. 575,170, May 7, 1975, and a continuation-in-part of Ser. No. 602,223, Aug. 6, 1975, said Ser. No. 575,170, is a continuation of Ser. No. 499,155, Aug. 21, 1975, abandoned, said Ser. No. 602,223, is a continuation of Ser. No. 333,723, Feb. 20, 1973, abandoned. This application Apr. 9, 1976, Ser. No. 675,275

Claims priority, application Germany, Mar. 2, 1972, 2210013

Int. Cl.[2] B29F *1/10*

U.S. Cl. 425—112 **16 Claims**

1. Apparatus for injection molding containers from thermoplastic material comprising central die means including a plurality of individual central die members and motive means moving said central die members intermittently one behind the other along a given path, side die means including a pair of side die members flanking said central die means and including means moving said side die members transversely to said given path of said central die members into and out of operative engagement with said central die means, said central die means and said side die means being configured to form therebetween when in operative engagement with each other a die cavity within which thermoplastic material may be injected to form said containers, means for supplying into said die cavity a base material about which thermoplastic material may be injection molded to form said containers, said base material supply means being operative to supply said base material in the form of two separate sheets from opposite sides of said central die means, means operable to inject into said die cavity a thermoplastic material, said motive means operating to move said



central die members in succession from one side of said side die members to between said side die members and to the opposite side of said side die members, said central and side die means forming a die cavity configured to receive injected thermoplastic material to form a seal between said separate sheets of base material at a point rearwardly of a given central die member when said given central die member is in engagement between said side die members, the next succeeding central die member being positioned to engage said sheets of base material to pull said sheets from said supply means thereof as said next succeeding central die member moves to between said side die members, and means operable to inject formed containers from about said central die means when said side die means are out of operative engagement with said central die means.

4,074,962

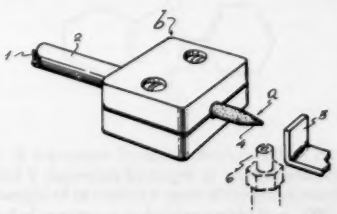
ELECTRODE CONSTRUCTION FOR A PIEZOELECTRIC LIGHTER

Ernesto A. Vainer, Buenos Aires, Argentina, assignor to Manufactura de Articulos para el Hogar "Aurora" S.A. Industrial, Comercial, Inmobiliaria y Financiera, Argentina

Filed Nov. 3, 1975, Ser. No. 628,527

Int. Cl.[2] F23Q *2/28, 3/01*

U.S. Cl. 431—255 **2 Claims**



1. In a portable piezoelectric type lighter having a pressurized fluid fuel deposit therein, an exit orifice for permitting the release of said fluid, a pair of electrodes, said electrodes connected to a piezoelectric ignition unit for developing an electric potential between said electrodes when said ignition unit is actuated, and a gap separating the pair of electrodes by a

predetermined distance, an improved electrode construction comprising:

at least one of said electrodes being elongated and formed of silicon carbide, said silicon carbide electrode having a pair of tapered ends;

a conductor connected to a positive pole of said piezoelectric ignition unit having one of said ends of said silicon carbide electrode connected to said conductor, the other end of said silicon carbide facing said other electrode to form a gap therebetween; and

a fastening means of electrically insulating material for covering the connected portions of said conductor and said silicon carbide electrode, said fastening means includes at least two complimentary pieces adapted to fit together and form an inner canal therein for receiving the connecting ends of said conductor and said silicon carbide electrode.

4,074,963

KILN

William J. Walsh, Dubuque, Iowa, assignor to Sybron Corporation, Rochester, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,380

Int. Cl.[2] F27D *1/18*

U.S. Cl. 432—250 **3 Claims**

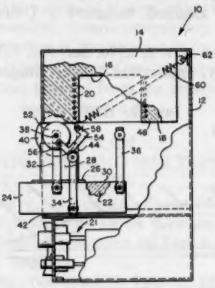
1. A kiln, furnace or the like comprising:

a. a frame;

b. an oven body in said frame, said oven body enclosing a firing chamber which opens through the bottom of said body;

c. a door for closing said opening including a hearth plate portion for supporting articles to be heated in said firing chamber when said door is in a closed position;

d. at least two parallel links on each side of said door, each link having a first end pivoted to said frame and a second end pivoted to said door to form a parallel motion linkage



for maintaining said door horizontally oriented as said door moves from a closed position to an open position; and

e. said first end of each link being located below said second end by a distance of about one-half the vertical height of said chamber when said door is in a closed position.

4,074,964

METHOD OF COLORING HAIR USING A PRESSURE SENSITIVE ADHESIVE

H. David Wells, 201 178th Drive, North Miami Beach, Fla. 33160

Filed Sept. 7, 1976, Ser. No. 720,553
Int. Cl.[2] A61K 7/13; G02B 27/00
U.S. Cl. 8—10.2 4 Claims

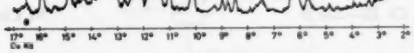
1. A method of coloring hair comprising, separating the hair of a subject's scalp to define a plurality of individual sectors, separated by part lines; applying tape means along the length of each of said part lines, said tape means providing a pressure-sensitive adhesive on the inner surface thereof contacting said part lines and on its outer surface; separating at least one discrete lock of hair from the area within one of said sectors and laying the same on a thin, flexible, liquid impervious sheet sized to lengthwisely span and to overlie at least a portion of the outer surface of at least two adjacent lengths of said tape means; applying a coloring solution to said discrete lock of hair and rolling said lock in said sheet toward the root ends thereof to form a pocket of hair and coloring solution, and pressing opposed end portions of said packet into engagement with said outer surface pressure-sensitive adhesive of said two adjacent lengths of tape means for securing purposes.

4,074,965

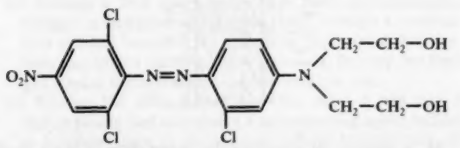
STABLE MONOAZO DYESTUFF

Hubert Kruse, Kelkheim, Taunus, and Karl Sommer, Konigstein, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 7, 1976, Ser. No. 684,088
Claims priority, application Germany, May 9, 1975, 2520577
Int. Cl.[2] C09B 27/00; C07C 107/00
U.S. Cl. 8—41 R 4 Claims



1. The modification being stable under dyeing conditions of the dyestuff of the formula



characterized by an X-ray diffraction diagram with characteristic reflexes at the following glance angles θ with the relative intensities as given below:

[o]	2.45	6.30	10.07	11.00	11.35	11.70	12.36	13.55	14.80	15.85
	63	100	30	48	83	88	86	59	52	34

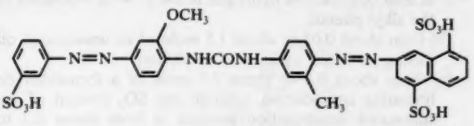
4,074,966

STABLE CONCENTRATED LIQUID PREPARATION OF A PAPER DYE OF THE DISAZO CLASS

Roger Lacroix, Huningue, France, and Roland Haberli, Wurenlingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 30, 1976, Ser. No. 701,458
Claims priority, application Switzerland, July 3, 1975, 8677/75
Int. Cl.[2] C09B 67/00, 31/02
U.S. Cl. 8—41 R 5 Claims

1. Stable concentrated liquid preparation of a paper dye of the disazo class, which preparation contains 20 to 40 per cent by weight of the dye of the formula



or an alkali salt thereof, dissolved in 10 to 30 per cent by weight of water and 40 to 60 per cent by weight of a tetraalkylene glycol.

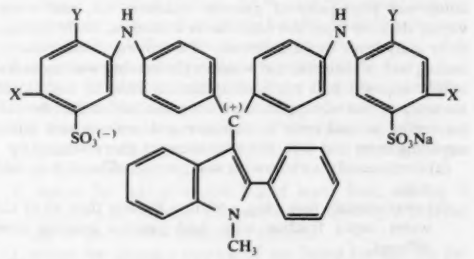
4,074,967

DYESTUFF PREPARATIONS FOR DYEING AND PRINTING NATURAL AND SYNTHETIC POLYAMIDE FIBRE MATERIALS

Hermann Fuchs, Kelkheim, Taunus; Gustav Kapaun, Neuenhain, Taunus, and Fritz Meininger, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 22, 1974, Ser. No. 526,389
Claims priority, application Germany, Nov. 24, 1973, 2358586
Int. Cl.[2] C09B 11/00; D06P 3/24
U.S. Cl. 8—54 1 Claim

1. A highly water-soluble composition for the dyeing or printing of native or synthetic polyamide fibres essentially of (a) 10 to 99 parts by weight of at least one dyestuff of the formula



in which X represents hydroxy, methyl, ethyl, methoxy or ethoxy, and Y represents hydrogen or methyl, and (b) 0.5 to 90 parts by weight of an auxiliary agent of the group consisting of a polyglycol of an average molecular weight from 3000 to 20,000, a polyglycolether (containing 15 to 30 ether groups) of a fatty alcohol of 8 to 20 carbon atoms, an alkali metal salt of a dialkylnaphthalene sulfonic acid (alkyl C_1 – C_6), a methyltauride of a saturated or unsaturated fatty acid of 8 to 20 carbon atoms, and an isethionate of a saturated or unsaturated fatty acid of 8 to 20 carbon atoms, and mixtures thereof.

4,074,968
RETANNING AND FATLIQUORING AGENT

Stanley A. Lipowski, Livingston, N.J.; Joseph W. Dehn, Jr., Great Neck, N.Y., and Clinton E. Retzsch, Morris Township, Morris County, N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Apr. 15, 1976, Ser. No. 677,494
Int. Cl.[2] C14C *3/20, 9/02*
U.S. Cl. 8—94.22 22 Claims

1. A retanning and fatliquoring agent comprising a sulfonated condensation product of

(a) one mole of a hydroxy component selected from the group consisting of phenol and a lower alkyl phenol having at least one alkyl of from one to two carbon atoms and at least one reactive hydrogen in the 2-, 4- or 6-position of the alkyl phenol,

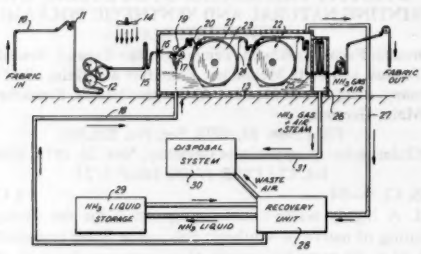
(b) from about 0.05 to about 1.5 mole of an unsaturated oil having an iodine value of over 60, and

(c) from about 0.4 to about 1.0 mole of a formaldehyde liberating composition wherein the SO_3 content of the sulfonated condensation product is from about 0.3 to about 1.5 mole of SO_3 per mole of hydroxy component.

4,074,969
PROCESS FOR RECOVERY AND REUSE OF AMMONIA IN A LIQUID AMMONIA FABRIC TREATING SYSTEM

Jackson Lawrence, Troy, N.Y., assignor to Cluett, Peabody & Co., Inc., New York, N.Y.

Continuation-in-part of Ser. No. 490,202, July 19, 1974, abandoned. This application Apr. 21, 1976, Ser. No. 679,059
Int. Cl.[2] D06M *1/24;* F25J *3/00*
U.S. Cl. 8—125 13 Claims



1. In a continuous process for recycling gaseous effluents, comprised principally of gaseous ammonia, air, and water vapor, derived from the continuous treatment, with substantially anhydrous liquid ammonia, of a moving cellulosic-containing web of material, and wherein the moving web is continuously exposed in a confined treatment zone to said liquid ammonia at near-atmospheric pressure, and said web is thereafter heated in said zone to vaporize and remove said liquid ammonia from said web, the improvement characterized by

(a) continuously withdrawing said gaseous effluent from said zone,

(b) continuously removing a portion but less than all of the water vapor fraction from said gaseous treating zone effluent,

(c) continuously introducing said withdrawn gaseous effluent into a body of substantially anhydrous liquid ammonia maintained at about atmospheric pressure to cool said gaseous ammonia and to condense water vapor from said gaseous ammonia,

(d) thereafter compressing and condensing the gaseous ammonia,

(e) continuously withdrawing substantially anhydrous liquid ammonia, together with condensed water, from said body and supplying the withdrawn liquid to said treatment zone for said exposing step, and

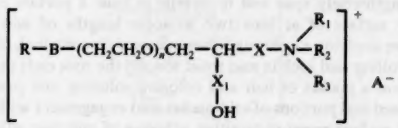
(f) continuously replenishing said body of substantially anhydrous liquid ammonia with anhydrous liquid ammonia from said compressing and condensing step.

4,074,970
DYEING OF SYNTHETIC FIBERS WITH CATIONIC DYES IN THE PRESENCE OF CATIONIC ASSISTANTS CONTAINING HYDROXYL AND CYCLIC MOIETIES

Robert Feigin, West Orange, N.J., assignor to Sybron Corporation, Rochester, N.Y.

Filed Nov. 15, 1976, Ser. No. 741,703
Int. Cl.[2] C09B *67/00;* D06P *1/41, 1/642*
U.S. Cl. 8—169 9 Claims

1. A process for coloring cationic-dyeable fibers in the presence of compounds having the structure:



where R is selected from the group of aliphatic hydrocarbons containing about 8 to 22 carbon atoms, mono- and di-alkylbenzenes where the alkyl chains contain about 8 to 12 carbon atoms each,

B is selected from the group of —CH_2—, oxygen atom and sulfur atom

n is a number ranging from zero to about 4

R_1, R_2, R_3 contain at least cyclic or heterocyclic structure and together contain no more than one hydroxyl group

A is a water-solubilizing anion

x = $(CH_2)_a$ and X_1 = (CH_2)

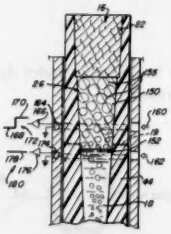
a = 0 or 1 and b = 0 or 1

and a + b = 1.

4,074,971
APPARATUS AND METHOD FOR THE PHARMACOLOGICAL MANIPULATION OF THE COAGULATION MECHANISM IN BLOOD AND FOR SIGNALLING THE EVENT OF BLOOD COAGULATION

Walter Jacob Braun; John Henry Altshuler, both of Englewood, and Peter Whitfield Cherry, Boulder, all of Colo., assignors to HemoTec, Inc., Englewood, Colo.

Filed Jan. 16, 1976, Ser. No. 649,649
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230 B 51 Claims



34. A method for detecting the coagulation of body fluids including blood comprising the steps of:

injecting gas into the body fluid so that bubbles are formed above the surface of the fluid,

generating a signal upon the presence of bubbles above the surface of the fluid indicative that gas is being injected,

collecting the fluid from the bubbles above the surface of the fluid only when the body fluid coagulates, and

generating a detection signal in response to a predetermined

drop in the surface level of the fluid occurring due to said collection.

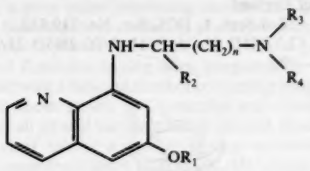
4,074,972

UREA ASSAY

Jerry W. Denney, Carmel, Ind., assignor to American Monitor Corporation, Indianapolis, Ind.

Filed Nov. 10, 1976, Ser. No. 740,612
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **4 Claims**

1. A process for the quantitation of urea in a fluid sample, in which the sample is reacted with an acidic solution of o-phthalaldehyde and an acidic solution of a chromogenic compound having the following general structure:



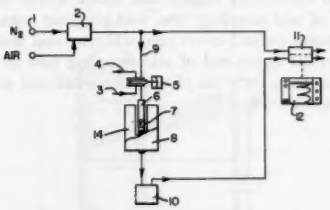
where R_1 is —H or $—CH_3$ and where R_2 is $—CH_3$ or $—C_2H_5$ or —H and where R_3 and R_4 are —H or $—CH_3$ and where n is 1, 2, or 3.

4,074,973

METHOD AND APPARATUS FOR DETERMINING TOTAL OXYGEN DEMAND OF COMBUSTIBLE MATERIALS IN AQUEOUS DISPERSION

Hiroyuki Igaki; Yoshiki Shibata, and Masao Saruyama, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 638,361, Feb. 8, 1975. This application Mar. 22, 1976, Ser. No. 669,272
Int. Cl.² G01N *31/12*
U.S. Cl. 23—230 PC **7 Claims**



1. A method for measuring the total oxygen demand of a combustible material in an aqueous dispersion containing halide of alkali metals or alkaline earth metals which comprises:

(a) flowing a feed gas stream of an inert gas containing oxygen at an essentially constant rate through a combustion conduit heated at a combustion supporting temperature and within the combustion conduit, flowing the feed gas stream through a combustion catalyst bed,

(b) flowing the effluent gas from the catalyst bed into a decomposing bed containing a decomposing agent heated at a temperature to decompose sodium hypochlorite or hydrogen hypochlorite substantially instantly by action of the decomposing agent,

(c) flowing the effluent gas from the decomposing agent bed into a continuous quantitative detector for gaseous oxygen to produce an electric signal which varies with the oxygen content of the effluent gas, and

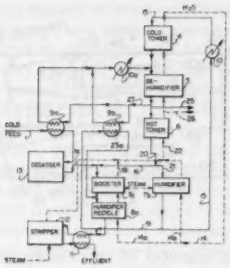
(d) while continuing the above procedure, injecting a small amount of an aqueous dispersion containing combustible material into the combustion conduit upstream from the catalyst bed whereby an electrical signal correlative with the total oxygen demand of an aqueous dispersion is produced.

4,074,974

DUAL TEMPERATURE ISOTOPE EXCHANGE APPARATUS USING HOT FEED WITH LIQUID RECYCLE FROM THE HUMIDIFIER

Gerard J. C. A. Pauluis, Brussels, Belgium, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Mar. 17, 1976, Ser. No. 667,725
Claims priority, application Canada, Mar. 21, 1975, 222776
Int. Cl.² B01D *59/33;* C01B *5/02*
U.S. Cl. 23—270 R **2 Claims**



1. A dual temperature deuterium extraction apparatus comprising:

a. a hot and cold tower with liquid water and hydrogen sulphide gas streams passing in countercurrent deuterium exchange relation therein;

b. a dehumidifier between hot and cold towers through which gas from the hot tower passes to the cold tower and liquid from the cold tower passes to the hot tower,

c. a by-pass humidifier section,

d. a humidifier recycle section,

e. a booster humidifier section,

f. means for taking gas from the cold tower and passing a portion through the by-pass humidifier to the hot tower and the remaining portion through the humidifier recycle section and the booster humidifier section in series to the hot tower,

g. means for taking a liquid output from the hot tower and passing a portion through the by-pass humidifier and the remaining portion through the booster humidifier section and the humidifier recycle section in series,

h. a gas stripper having a steam injection inlet,

i. means for taking the liquid output from the humidifier recycle section and passing it through the said stripper via a first heat exchanger and out of the system as effluent,

j. means for taking gas from the stripper and passing the gas to the hot tower,

k. means for taking a cold liquid input feed, passing it through a second heat exchanger and injecting it into the top of the booster humidifier section,

l. means for taking a portion of the liquid leaving the dehumidifier and passing a portion of this through the said second heat exchanger to heat the cold liquid feed and the remaining portion through a third heat exchanger and returning both portions to the liquid input of the dehumidifier,

m. means for taking a liquid output from the by-pass humidifier section, recycling a portion to the top of the cold tower and passing the remaining portion through the said third heat exchanger and back to the top of the humidifier recycle section,

n. means for taking an output of gas or liquid or both en-

riched in deuterium from a location in the apparatus between the cold and hot towers.

4,074,975

COMBINATION EXHAUST-GAS CLEANER AND MUFFLER FOR AN AUTOMOBILE ENGINE

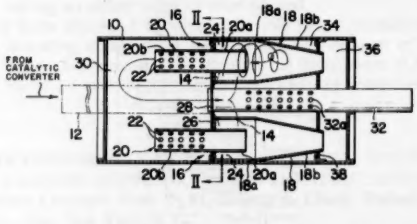
Naomi Tokura, Yokosuka; Kenji Masaki, Yokohama, and Hatuo Nagaisi, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Continuation-in-part of Ser. No. 466,879, May 3, 1974, abandoned. This application Dec. 23, 1975, Ser. No. 643,702

Claims priority, application Japan, May 7, 1973, 48-53449[U]; June 18, 1973, 48-719380[U]

Int. Cl.[2] **B01J** *8/00;* **F01N** *3/15;* **B01D** *45/12, 51/02*

U.S. Cl. 23—288 F **21 Claims**



1. A combined assembly of an exhaust-gas cleaner and a muffler, which assembly is to be connected to an exhaust port of a catalytic converter of an internal combustion engine system for removing dust particles discharged from the catalytic converter and simultaneously dampening of noises borne by exhaust gases dicharged from the combustion engine, the assembly comprising:

an exhaust gas inlet tube located immediately downstream of and in communication with the catalytic converter so that a stream of exhaust gases entraining dust particles is admitted into said exhaust inlet tube from the catalytic converter;

two identical centrifugal separators located downstream of said exhaust inlet tube for imparting centrifugal force to the stream of said exhaust gases being passed from said exhaust inlet tube into the centrifugal separators and thereby separating the dust particles from the exhaust gases, said centrifugal separators being arranged parallel to each other and aligned in the same direction, each said separators including a gas inlet opening which is in fluid communication with the exhaust inlet tube for admitting the stream of the exhaust gases thereinto from the exhaust inlet tube and a respective dust discharge opening for discharging from the centrifugal separator the dust particles separated from the exhaust gases in the separator and a respective gas discharge opening for discharging from the centrifugal separator the stream of the exhaust gases cleaned of the dust particles;

a single resonance-type silencer dust collection chamber in fluid communication with both of said centrifugal separators through the corresponding said dust discharge opening for depositing therein the dust particles discharged from said centrifugal separators;

a first silencer chamber location downstream of said centrifugal separators and in fluid communication therewith via said gas discharge openings for dampening noises borne by the exhaust gases;

an exhaust outlet tube located downstream of and in fluid communication with said centrifugal separators via said first silencer chamber so that the stream of exhaust gases cleaned of the dust particles and discharged from both of said gas discharge openings of said centrifugal separators is admitted into said exhaust outlet tube and finally discharged into the open air; and at least one additional silencer chamber in fluid communication with said exhaust outlet tube and downstream of said first silencer chamber for dampening noises borne by the exhaust gases.

4,074,976

LEVELING DEVICES FOR USE IN HIGH SPEED LIQUID SAMPLING SYSTEMS

Stephen G. M. Gower, 14 Hamilton Avenue, Pyrford, Surrey, GU22 8RS; Cyril R. Morris, 6 Millan Close, New Haw, Weybridge, Surrey, KT15 3NB, and Ernest Wright, Beriswood, Sheerwater Avenue, Woodham, Weybridge, Surrey, KT15 3DS, all of England

Filed Sept. 1, 1976, Ser. No. 719,632

Int. Cl.[2] **B01D** *21/26;* **B01L** *3/00;* **B65D** *23/12*

U.S. Cl. 23—292 **9 Claims**

1. A sample leveling device for use in a liquid sampling tube having an upper, open end and a lower, closed end, comprising in combination; an insert cup having an upper, open end and a lower, closed end, said lower end being offset from the centerline of the upper, open end of the insert cup, said insert being adapted for retention in the upper portion of said sampling tube in a spaced relationship from the walls of said tube and having support means at the upper end thereof; and a plug-cap adapted to frictionally engage and locate within the upper, open end of said sampling tube, said plug-cap engaging said support means on said insert cup, whereby said insert cup is retained in the upper end of said sampling tube in a spaced relationship from the walls of said tube when said plug-cap is inserted in said tube.

4,074,977

CHARCOAL BRIQUET SYSTEM

Philip N. Dunham, Fortune Rock, Biddeford, Maine 04005; John N. Tillyer, Center Street, and Armand Martin, Simpson Road, both of Saco, Maine, 04072

Filed June 11, 1976, Ser. No. 695,007

Int. Cl.[2] **C10L** *11/00*

U.S. Cl. 44—38 **8 Claims**

1. A charcoal briquet system comprising in combination

a. a quantity of charcoal briquets, and

b. a pad of easily ignitable material of a size sufficient to pile a number of briquets thereon,

c. said pad being formed of a soft, thin, flexible cellulosic material at least partially coated with wax and conformable to the contour of a pile of said briquets.

4. A system according to claim 1 wherein said pad is coated with wax about the margins thereof, the center portion and corners of said pad being substantially wax free.

6. A system according to claim 4 wherein the edges of said pad are corrugated.

4,074,978

COMBINATION OF ASPHALTENES WITH FLOW IMPROVER POLYMERS TO IMPROVE THE FLOW PROPERTIES OF HIGH BOILING FUEL OILS

Jerome Panzer, Roselle Park, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Oct. 12, 1973, Ser. No. 405,919
Int. Cl.[2] C10L 1/18
U.S. Cl. 44—62 7 Claims

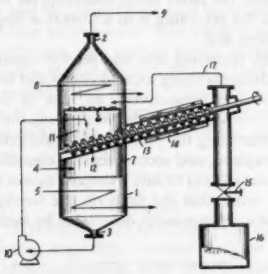
1. A petroleum fuel oil composition comprising a heavy waxy fuel oil selected from the group consisting of atmospheric residua, vacuum gas oil, vacuum bottoms, blends of said oils, and blends of said oils with middle distillate fuels, which are deficient in an asphaltene component wherein at least 20 weight percent of said composition boils above 600° F., containing a pour point improving amount of an oil-soluble polymeric flow improver consisting of a copolymer of behenyl fumarate and vinyl acetate in about equal molar proportions, the behenyl fumarate having been prepared by esterifying fumaric acid with a behenyl alcohol containing about 65 wt. % C_{22} alcohol, about 15 wt. % C_{20} alcohol and about 15 wt. % C_{18} alcohol, all of said alcohols being straight chain alcohols, said copolymer having a number average molecular weight within the range from about 1000 to 100,000, which oil composition has been improved with respect to its responsiveness to said flow improver by adding an amount of asphaltene sufficient to increase the asphaltene content of said oil by 0.05 to 10 weight percent.

4,074,979

THERMAL DECOMPOSITION APPARATUS

Shingo Kurisu; Toshiya Oyamoto, both of Mihara; Setumi Ochiai, Fukuyama; Hiromu Miyamoto, Onomichi, and Katsuaki Makino, Mihara, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 571,988, April 28, 1975, abandoned, which is a continuation of Ser. No. 391,017, Aug. 28, 1973, abandoned. This application Dec. 5, 1975, Ser. No. 637,979
Int. Cl.[2] C10J 3/20
U.S. Cl. 48—111 4 Claims



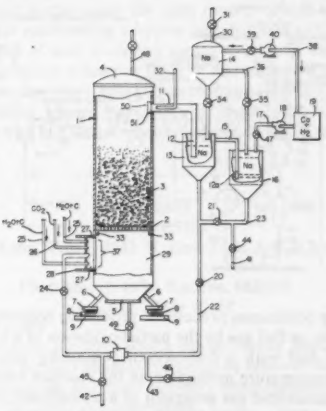
1. Thermal decomposition apparatus for converting waste materials into gaseous products having a predetermined maximum boiling point comprising furnace means having an upper part and a lower part, supply means for introducing waste materials into said furnace means, gas product exhaust means located at the upper part of said furnace, residue discharge means located at the lower part of said furnace, heating means located at the lower part of said furnace for heating said waste materials in said furnace to evolve a gas by thermal decomposition of said waste materials thereby to create gas flow upwardly within said furnace means, cooling means located at the upper part of said furnace arranged to have upwardly flowing gas passed thereacross to change the temperature of said gas in accordance with the temperature of said cooling means, control means for adjusting the temperature of said cooling means to maintain the temperature of gas flowing thereacross at a level not higher than a predetermined maximum temperature level thereby to effect condensation at said cooling means of the components of said gas having a boiling point above said maximum temperature level, temperature sensing means for sensing the temperature of gas flowing across said cooling means, said control means being responsive to said temperature sensing means to maintain the temperature of said cooling means at a level commensurate with the desired predetermined maximum temperature level of gas flowing thereacross, tray means extending across said furnace between said cooling means and said heating means to receive therein condensed liquid dropping from said cooling means, said tray means including means defining orifices therethrough for enabling gas flow through said tray means to cause said gas flow to be brought into contact with said liquid received within said tray means and downflow tubes extending from said tray means to direct liquid flow from said tray means downwardly toward said heating means thereby to bring said downwardly flowing liquid into contact with said heating means to effect vaporization thereof, densifier means located between said heating means and said tray means to remove from said furnace solid residue deposited on said densifier means, and recycling means for removing material from said residue discharge means of said furnace means and delivering said removed material onto said densifier means, with adjustment of the temperature of said cooling means operating to control the temperature of gas flowing through said gas exhaust means thereby to condense out of said gas any constituents having a boiling point higher than said predetermined maximum temperature level to prevent entry of such higher boiling point constituents into said exhaust means, said apparatus thereby operating to prevent clogging thereof by solidification of the decomposition product passing through the exhaust means of said apparatus.

4,074,980

PROCESS FOR PRODUCTION OF CARBON MONOXIDE AND HYDROGEN

Eugene Wainer, Shaker Heights, Ohio, assignor to Horizons Research Incorporated, Cleveland, Ohio

Filed July 2, 1976, Ser. No. 702,003
Int. Cl.[2] C10J 3/54
U.S. Cl. 48—197 R 10 Claims



1. A process for the manufacture of a gaseous mixture of hydrogen and carbon monoxide which comprises:

spraying a first stream consisting of hot molten alkali metal selected from the group consisting of Na, K, and mixtures of Na and K in which such hot molten alkali stream is maintained during spraying at a temperature of 350° C, into a first reaction chamber;

spraying one additional stream of a mixture of CO_2, H_2O, and C in which the temperature of the stream is about 350° C into the same first reaction chamber in such a way that

said first stream and said additional stream commingle and react immediately on entering said first reaction chamber, producing primarily an atomized mixture of alkali carbonate and alkali hydroxide containing minor amounts of carbon monoxide and hydrogen;

providing a fluidizable bed of light weight iron balls supporting particulate material selected from the group consisting of metallic iron, nickel, cobalt, manganese, oxides of said metals, alloys of said metals and mixtures of said metals, their oxides and their alloys, in a second reaction chamber maintained at a temperature not exceeding 850° C, adjacent to said first reaction chamber and in direct communication with said first reaction chamber;

immediately conducting the sprayed materials and their reaction products in atomized and gaseous form from said first reaction chamber into said bed of particulate material in said second reaction chamber while said bed is maintained in fluidizable condition as a consequence of a gas passage and formation while the bed is being vibrated, maintaining the second reaction chamber at a temperature in the range of 650° to 850° C, thereby reducing the alkali hydroxide and alkali carbonates from said first chamber reaction products as a consequence of reaction of alkali carbonates and alkali hydroxides with said particulate material to produce alkali metal gas as a consequence of maintaining a pressure below 0.5 atmosphere in the second reaction chamber and a mixture of hydrogen and carbon monoxide; and

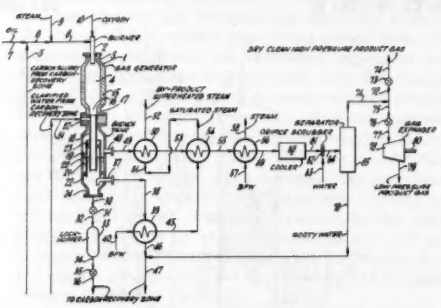
separately recovering the regenerated alkali metals and the hydrogen and carbon monoxide products of said reactions.

4,074,981

PARTIAL OXIDATION PROCESS

William L. Slater, La Habra, Calif., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 10, 1976, Ser. No. 749,658
Int. Cl.² C10J *1/00*
U.S. Cl. 48—197 R **8 Claims**



8. In a continuous process for producing reducing gas, synthesis gas, or fuel gas by the partial oxidation of a hydrocarbonaceous fuel with a free-oxygen containing gas, optionally with a temperature moderator, in the reaction zone of a free-flow noncatalytic gas generator at a temperature in the range of about 1500° to 3500° F. and a pressure in the range of about 1 to 250 atmospheres; and cooling and cleaning the effluent gas stream from the reaction zone by direct contact with water in a quench zone thereby producing a dispersion of particulate carbon and quench water; the improvement comprising:

(1) cooling the process gas stream leaving said quench zone by passing said process gas stream serially through first and second heat exchange zones in indirect heat exchange with a coolant;

(2) cooling at least a portion of the particulate carbon-quench water dispersion from said quench zone in a third heat exchange zone in indirect heat exchange with a stream of boiler feed water; and

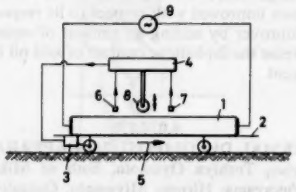
(3) passing the heated boiler feed water leaving said third heat exchange zone in (2) through said second heat exchange zone in (1) as said coolant, whereby said boiler feed water is converted into a stream of saturated steam; and (4) passing said stream of saturated steam from (3) through said first heat exchange zone in (1) as said coolant, whereby said saturated steam is converted into superheated steam.

4,074,982

PROCESS AND MEANS FOR GRINDING OUT FAULTS IN THE SURFACE OF A WORK PIECE

Heinz Koch, Sprockhovel; Manfred Pawlowicz, and Bernhard Brams, both of Schermbeck-Damm, all of Germany, assignors to Fried Krupp Huttenwerke AG, Bochum, Germany

Filed Feb. 16, 1977, Ser. No. 769,003
Claims priority, application Germany, Feb. 20, 1976, 2606853
Int. Cl.² B24B *7/02, 1/00*
U.S. Cl. 51—92 R **10 Claims**



6. An apparatus for grinding out faults on the surface of ferromagnetic material comprising:

a grinding device placeable on the workpiece;

magnetizing means placeable in the vicinity of said workpiece for magnetizing the latter;

transport means for operatively moving the workpiece in one direction, the latter being placeable on said transport means, and for returning it in a direction opposite to the first direction; and

control means, including first and second sensing elements, the latter elements being located ahead and in back of said grinding device, respectively, as seen in the operative direction of movement of the workpiece, the first sensing element controlling the placement of said grinding device on the workpiece, said second sensing element controlling the return movement of said transport means upon sensing a fault, in order that the fault on the workpiece can be ground and is subsequently detectable by said first sensing element.

4,074,983

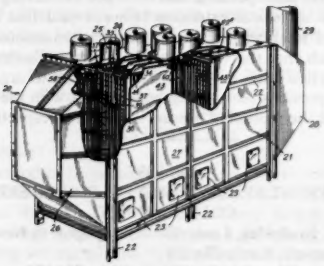
WET ELECTROSTATIC PRECIPITATORS

Even Bakke, New Providence, N.J., assignor to United States Filter Corporation, New York, N.Y.

Division of Ser. No. 329,269, Feb. 2, 1973, Pat. No. 3,958,960. This application Jan. 14, 1976, Ser. No. 648,839
Int. Cl.² B03C *3/74*
U.S. Cl. 55—118 **7 Claims**

1. A wet electrostatic precipitator comprising, in combination, a housing having inlet and outlet openings and defining a substantially horizontal flow path between said inlet and outlet openings; at least one electrostatic field section in said housing in said horizontal flow path including a plurality of collection plates, a plurality of discharge electrodes in spaced relation with said collection plates and means applying an electric potential between said collection plates and said electrodes; said housing directing a gaseous medium, containing material to be precipitated, from said inlet opening along with substan-

tially horizontal flow path extending through said electrostatic field section for substantially precipitation of said material by said at least one electrostatic field section; means directing continuous sprays of washing liquid against said collection plates; and an electrostatic mist eliminator section in said substantially horizontal flow path in said housing intermediate the last of said at least one electrostatic field section and said outlet opening, said mist eliminator section being free from continuous sprays of washing liquid and including further discharge electrodes, further collection plates positioned in spaced relation with said further discharge electrodes along said horizontal flow path intermediate said further discharge electrodes and said outlet opening, and means applying an electric charge potential between said further discharge electrodes and said further collection plates to establish an electrostatic barrier barring passage of very small drops of liquid therethrough, said further collection plates being formed of a first group of relatively narrow and elongated transverse baffles extending transverse to said horizontal flow path and arranged in spaced relation along at least two rows, said rows being spaced along said horizontal flow path, with the baffles of each of two adjacent rows arranged in alignment with the spaces between the baffles of the other of the two adjacent rows, said precipitator including still further collection plates formed of a second group of relatively narrow and elongated transverse baffles extending transverse to the horizontal flow path and positioned along said horizontal flow path intermediate said last of said at least one electrostatic field section and said further discharge electrodes, said second group of transverse baffles being arranged in spaced relation along at least two rows, said rows being spaced along said horizontal flow path, with the baffles of each of two adjacent rows arranged in alignment with the spaces between the baffles of the other of the two adjacent rows.



4,074,984

SOLVENT-RECOVERY SYSTEM

Heinrich Führing, Augsburg, Germany, assignor to Böwe Böhler & Weber Maschinenfabrik, Augsburg, Germany

Filed May 21, 1976, Ser. No. 688,894
Claims priority, application Germany, May 24, 1975, 2523079
Int. Cl.² B01D *53/04*
U.S. Cl. 55—163 **11 Claims**

1. A system for recovering organic solvent from a plant which includes a plurality of treatment units intermittently using such solvent during a working phase followed by a recovery phase, each treatment unit being provided with a treatment vessel and with individual switchover means establishing a closed circuit through said vessel during said working phase, said closed circuit including equipment for heating and drying the air circulating therethrough, and for connecting said vessel between an inlet manifold and an outlet manifold in said recovery phase, each treatment unit being further provided with individual circulation means for driving the solvent through said closed circuit in said working phase, said system comprising:

an incoming duct connected to said outlet manifold for receiving solvent-laden air from any treatment unit of said plant during the recovery phase thereof;

an outgoing duct connected to said inlet manifold for the delivery of substantially clean air to any treatment unit of said plant during the recovery phase thereof;

conduit means forming an air-circulating path with said ducts, said path including blower means for generating a continuous airflow traversing any treatment unit thereof which is in its recovery phase;

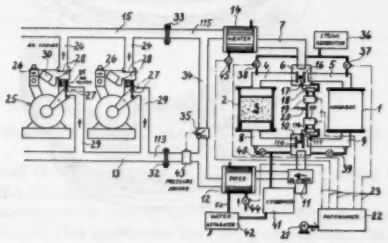
air-heating means at an upstream location in said path;

air-drying means at a downstream location in said path;

a pair of substantially identical adsorbers for solvent entrained by said airflow;

a regenerating circuit for said adsorbers including a source of steam;

a programmer independent of said switchover means of any treatment unit establishing a recurrent operating cycle



divided into alternate active and inactive half-cycles for each adsorber;

first valve means controlled by said programmer for alternately connecting said adsorbers in said path, between said upstream and downstream locations, during respective active half-cycles thereof;

second valve means controlled by said programmer for periodically connecting each adsorber, during its inactive half-cycles, in said regenerating circuit for the retrieval of solvent accumulated in preceding half-cycles; and

third valve means under the joint control of said treatment units for establishing a bypass path for said airflow from an outlet of said air-drying means to an inlet of said air-heating means whenever none of said treatment units is in its recovery phase, said bypass closing a loop through said air-heating means, the active adsorber, said air-drying means and said blower means independently of said manifolds.

4,074,985

AIR FILTER

Raymond Zeno Willas, 4343 N. Oak Park Ave., Chicago, Ill. 60634

Filed May 4, 1976, Ser. No. 683,026
Int. Cl.² B01D *46/24*
U.S. Cl. 55—498 **4 Claims**

1. An air filter assembly which can be readily disassembled to permit the filtering element thereof to be removed for washing or replacement, said filter assembly being mounted within an air filter housing, and comprising

an annular substantially rigid foraminous support having a substantially constant height,

an elongated flexible filtering element having opposite ends and a height substantially the same as the height of said foraminous support, said filtering element having a substantially uniform thickness defined by outside and inside substantially regular surfaces, the length of said elongated filter element being substantially equal to the circumference of said foraminous support,

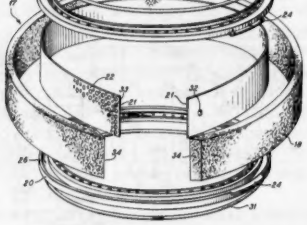
said filtering element being freely wrapped around said

foraminous support and being readily separable therefrom,

upper and lower integrally molded mounting rings which are of a like construction and are interchangeable, said upper and lower mounting rings each having an exterior side and an interior side relative to said foraminous support and filtering element,

an annular seating groove on the interior side of said upper and lower mounting rings,

a continuous sealing trench inwardly of said annular seating groove which is located on the interior side of each mounting ring, and an O-ring member positioned by O-ring supports radially crossing said sealing trench a predetermined distance below the top of said mounting ring so that the O-ring member projects above the mounting ring when in place, said O-rings sealingly engaging said air filter housing enclosing said air filter assembly,



the continuous top portions and the continuous bottom portions of said foraminous support and wrappped filtering element being snugly and removably seated in said annular seating grooves of said upper and lower mounting rings respectively,

whereby said upper and lower mounting rings are readily separable from said filtering element and said filtering element is readily separable from said foraminous support permitting said filterng element to be removed for washing or replacement.

4,074,986

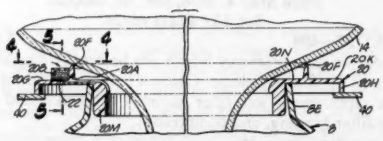
VALVED WATER CONTAINER WITH SEAL

Carl E. Frahm, and Shirley E. Frahm, both of 1428 Oak Meadow Road, Arcadia, Calif. 91006

Continuation of Ser. No. 680,071, April 26, 1976, abandoned, which is a continuation of Ser. No. 494,464, Aug. 5, 1974, abandoned. This application Mar. 14, 1977, Ser. No. 777,357

Int. Cl.[2] B01D *46/10*

U.S. Cl. 55—502 **8 Claims**



1. An arrangement including a reservoir, said reservoir having a mouth portion, a mounting means for said reservoir, said mounting means including a flat surface adjacent to and spaced from said mouth portion of said reservoir so as to define an opening between said flat surface and said mouth portion, a replacement container for placement in an inverted position on said reservoir, an element for positioning between said flat surface of said mounting means and said container to close said opening, with said element serving the functions of mounting said container, closing said opening, and sealing and venting said reservoir, said element being annular and having a generally horizontally disposed base portion and having an inner opening generally of the size and shape of the mouth of said reservoir, a first relatively heavy sealing and mounting portion extending downwardly from said base portion for entering and snugly engaging an inner wall portion of said mouth portion to provide not only a firm support for the water container but also as a seal, a second relatively thin, flexible and tapered sealing ring portion on said base portion positioned outwardly of said first portion and extending upwardly from said base portion and being the sole means to engage said container, said second portion having a vent apertured portion extending therethrough, a third portion near the periphery of said base portion and extending downwardly therefrom for sealing contacting said flat surface of said mounting means for said reservoir, said second portion being located between said first portion and said third portion, said base portion having at least a part of its horizontal extension between said first and third portions of relatively thin cross section constructed and arranged such that the weight of the container acting on said second portion tends to flex said base portion to urge the first and third portions into sealing engagement with the reservoir mouth and the mounting means flat surface, respectively.

4,074,987

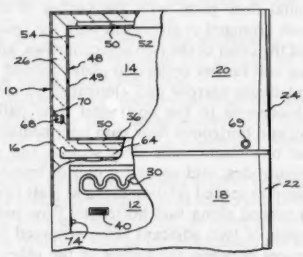
DEFROST SENSING SYSTEM FOR FREEZER COMPARTMENT

Edward B. Krulewich, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 3, 1977, Ser. No. 756,232

Int. Cl.[2] F25D *21/08*

U.S. Cl. 62—128 **10 Claims**



1. A refrigerator comprising a box-like liner defining both a freezer compartment and evaporator upon which frost collects, thermal insulating material surrounding the liner, and an outer refrigerator case, a frost sensing means interposed within the insulation in outer-spaced relation from the side of the liner and arranged adjacent the bottom, said frost sensing means being thermally sensitive at a preselected high temperature of the insulation at the completion of a defrost cycle.

4,074,988

GLASS FIBER COATING METHOD

George E. Eilerman, and Albert E. Tamosauskas, both of Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 637,341, Dec. 3, 1975, abandoned, which is a continuation of Ser. No. 512,648, Oct. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 384,876, Aug. 2, 1973, abandoned. This application May 27, 1977, Ser. No. 801,171

Int. Cl.[2] C03C *25/02*

U.S. Cl. 65—3 C **4 Claims**

1. In the method of preparing glass fiber strand for reinforcing elastomeric compositions comprising drawing glass fibers from molten cones of glass, applying to the fibers as they are

being drawn an aqueous coating and sizing composition containing a substantial quantity of water, an elastomeric latex, and a rubber adhesive, gathering the fibers into strands, and drying the strands to thereby provide glass fiber strands having a weight gain of between 15 and 40 percent by weight of said sizing and coating composition, based upon the weight of the dry glass, the improvement wherein said rubber adhesive consists essentially of a condensation reaction product of a polycarboxylic acid, or an anhydride, or a polyanhydride, or a tricarboxylic monoanhydride, each combined with a polyfunctional amine, said condensation reaction product having a low molecular weight to provide solubility of said condensation reaction product in aqueous ammonia, and ammonia in said aqueous coating and sizing composition in sufficient quantity to solubilize said condensation product.

4,074,989

METHOD OF PREPARING ANHYDROUS BORIC ACID-CONTAINING GLASS BATCH

Stanley F. Brzozowski, Coraopolis, and Joseph E. Cooper, Brackenridge, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 8, 1976, Ser. No. 739,883

The portion of the term of this patent subsequent to Feb. 21, 1995, has been disclaimed.

Int. Cl.[2] C03B *5/16*

U.S. Cl. 65—27 **5 Claims**

1. A method of preparing an anhydrous boric acid-containing glass fiber forming glass batch having a substantial amount of alumina therein comprising introducing anhydrous boric acid-containing batch ingredients into a pelletizing zone, agglomerating the ingredients with sufficient water to produce pellets containing about 10–25 percent free water by weight, heating the pellets at a temperature of at least 450° F. (232.2° C.) and drying the pellets at that temperature for a period of time sufficient to thereby prevent disintegration thereof and produce hard, nondusting pellets.

4,074,990

METHOD OF PREPARING COLEMANITE-CONTAINING GLASS BATCH

Stanley F. Brzozowski, Coraopolis, and Joseph E. Cooper, Brackenridge, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 8, 1976, Ser. No. 739,884

The portion of the term of this patent subsequent to Feb. 21, 1995, has been disclaimed.

Int. Cl.[2] C03B *5/16*

U.S. Cl. 65—27 **8 Claims**

1. A method of preparing a colemanite-containing glass fiber forming glass batch comprising introducing colemanite-containing batch ingredients into a pelletizing zone, agglomerating the ingredients with sufficient water to produce pellets containing about 5 to 20 percent by weight free water, heating the pellets at a temperature not greater than 770° F. (410° C.) and drying the pellets at that temperature for a period of time sufficient to thereby prevent disintegration thereof and form hard, non-dusting pellets.

4,074,991

METHOD OF PREPARING BORIC ACID-CONTAINING GLASS BATCH

Stanley F. Brzozowski, Coraopolis, and Joseph E. Cooper, Brackenridge, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

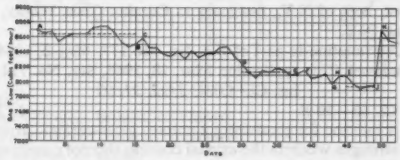
Filed Nov. 8, 1976, Ser. No. 739,885

The portion of the term of this patent subsequent to Feb. 21, 1995, has been disclaimed.

Int. Cl.[2] C03B *5/16*

U.S. Cl. 65—27 **6 Claims**

1. A method of preparing a boric acid-containing glass fiber forming glass batch having a substantial amount of alumina therein comprising introducing boric acid-containing batch ingredients into a pelletizing zone, agglomerating the ingredients with sufficient water to produce pellets containing about 5 to 22 percent by weight free water, heating the pellets at a



temperature of at least 220° F. (104.4° C.) and drying the pellets at that temperature for a period of time sufficient to thereby prevent disintegration thereof and produce hard, nondusting pellets.

4,074,992

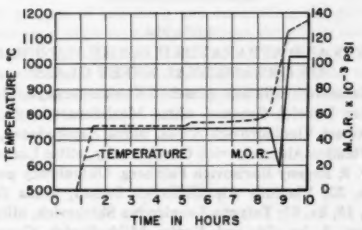
SODIUM ION-EXCHANGE ON SURFACE OF BETA-SPODUMENE

Raymond O. Voss, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 365,117, May 5, 1964, abandoned. This application Dec. 18, 1968, Ser. No. 784,635

Int. Cl.[2] C03C *3/22, 21/00*

U.S. Cl. 65—30 E **5 Claims**



1. A method for making a unitary glass-ceramic article of high strength wherein the crystal content thereof constitutes at least 50% by weight of the article with a surface compressive stress layer and an interior portion which comprises contacting a glass-ceramic article consisting essentially of Li_2O, Al_2O_3, and SiO_2, wherein the crystal phase therein consists essentially of beta-spodumene solid solution, at a temperature above 200° C. with a source of exchangeable sodium ions for a period of time sufficient to replace at least part of the lithium ions of said beta-spodumene solid solution in a surface layer of the article with a corresponding amount of sodium ions, said replacement not changing the essential crystal structure of the beta-spodumene solid solution crystals but thereby effecting a compressively stressed surface layer on the article.

4. A unitary glass-ceramic article of high strength wherein the crystal content thereof constitutes at least 50% by weight of the article with a surface compressive stress layer and an interior portion consisting essentially of Li_2O, Al_2O_3, and SiO_2, wherein the crystals of said interior portion consist essentially of beta-spodumene solid solution and the crystals of said surface compressive stress layer consist essentially of beta-spodumene solid solution, the crystal structure of said latter crystals being essentially unchanged but in at least a portion of which the proportion of lithium ions is less with a corresponding increase in an amount of sodium ions.

4,074,993
POTASSIUM ION-EXCHANGE ON SURFACE OF BETA-SPODUMENE

Roger G. Ackerman, Corning, and Bruce R. Karstetter, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 365,177, May 5, 1964, abandoned. This application Mar. 18, 1968, Ser. No. 714,013
Int. Cl.² C03C *3/22, 21/00*
U.S. Cl. 65—30 E **4 Claims**

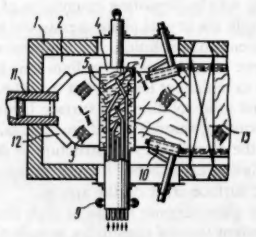
1. A method for producing a unitary glass-ceramic article of high strength wherein the crystal content thereof constitutes at least 50% by weight of the article with a surface compressive stress layer and an interior portion which comprises contacting a glass-ceramic article consisting essentially of Li_2O, Al_2O_3, and SiO_2, wherein the crystal phase therein consists essentially of beta-spodumene at a temperature between about 550°–800° C. with a source of potassium ions for a period of time sufficient to replace at least part of the lithium ions of said beta-spodumene in a surface layer of the article with a corresponding amount of potassium ions, said replacement not changing the essential crystal structure of the beta-spodumene crystals to thereby effect a compressively stressed surface layer on the article.

4. A unitary glass-ceramic article of high strength wherein the crystal content thereof constitutes at least 50% by weight of the article with a surface compressive stress layer and an interior portion consisting essentially of Li_2O, Al_2O_3, and SiO_2, wherein the crystals of said interior portion consist essentially of beta-spodumene and the crystals of said surface compressive stress layer consist essentially of beta-spodumene, the crystal structure of said latter crystals being essentially unchanged but in at least a portion of which the proportion of lithium ions is less with a corresponding increase in an amount of potassium ions.

4,074,994
PROCESS AND APPARATUS FOR THE MANUFACTURE OF ORNAMENTAL SHEET GLASS

Mark Leonovich Glikman, ploschad Kommunarnaya, 11, kv. 45; Zakhar Isaevich Sapunar, ulitsa Mezhdunarodnaya, 26, kv. 13; Albert Vladimirovich Avrus, ulitsa Zagorodneva, 15, kv. 77; Vladilen Alexandrovich Gorokhovsky, ulitsa Lomonosova, 3, kv. 9; Evgeny Borisovich Fainberg, Oktyabrsky poselok, 8 Linia, 32; Vladimir Alexandrovich Ivanov, ulitsa Zagorodneva, 15, kv. 81; Tatyana Leonidovna Shirkevich, ulitsa Lampovaya, 4, kv. 24, and Vadim Mikhailovich Sizov, ulitsa Lomonosova, 11, kv. 4, all of Saratov, U.S.S.R.

Filed Aug. 16, 1976, Ser. No. 714,763
Int. Cl.² C03B *18/02*
U.S. Cl. 65—44 **14 Claims**



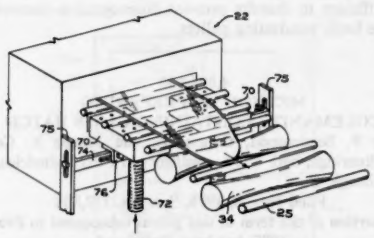
1. A process for the manufacture of ornamental sheet glass comprising continuously forming a glass strip on the surface of molten metal, concurrently treating the glass surface in plastic state with a reactant comprising a substance which is capable of forming a surface layer having a viscosity which is substantially greater than the viscosity of the basic glass mass in a quantity sufficient to form such a more viscous surface layer and immediately deforming the glass strip treated with said reactant in such a manner as to form rips in the resultant surface layer of the glass, the combination of rips defining an ornamental pattern of glass.

12. An apparatus for the manufacture of ornamental sheet glass comprising: a bath containing molten metal; elongated conduits having nozzles arranged in an overlapping pattern over said bath for feeding a reactant to the upper surface of a glass strip which is formed on the surface of molten metal, said reactant comprising a substance which is capable of forming a surface layer having a viscosity which is substantially greater than the viscosity of said glass strip; a system for feeding the reactant to said conduits provided for each of said conduits; a hollow casing filled with a cooling medium, said casing accommodating all said conduits leading to said conduits; driven endless tracks provided downstream of said casing in the direction of flow of said glass strip in contact with said strip, and means for moving said tracks at a different speed than said glass strip thus deforming the same to produce rips in the upper surface layer.

4,074,995
METHOD OF SHAPING GLASS SHEETS BY THE ROLL FORMING METHOD

Robert G. Frank, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 20, 1976, Ser. No. 752,379
Int. Cl.² C03B *29/04*
U.S. Cl. 65—104 **8 Claims**



1. In the method of shaping a series of glass sheets wherein each sheet in succession is conveyed through a furnace and heated therein to a softened condition sufficient for bending, then conveyed beyond the furnace in a longitudinal direction on conveyor means providing substantially horizontal support for the sheet into a bending zone where a set of lower rotating forming rolls having concave axial curvatures transverse to the direction of glass travel rise to lift the sheet above said conveyor means into rolling engagement with a set of upper rotating forming rolls having complementary convex axial curvatures transverse to the direction of glass travel, thereby imparting a curvature to the sheet, and wherein initial contact between a longitudinal side edge portion of the sheet and the lower forming rolls while central portions of the sheet remain out of contact with the lower forming rolls produces a localized bending force sufficient to cause kinking of the longitudinal side edge portion,

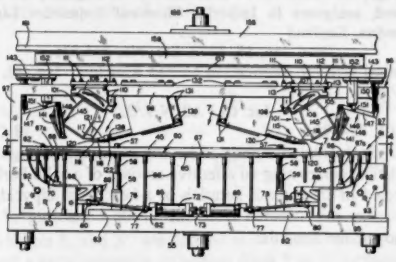
the improvement comprising differentially applying a superficial stream of cooling fluid onto said longitudinal side edge portion of the sheet after the sheet leaves the furnace and before the sheet is contacted by the lower forming rolls so as to cool the longitudinal side edge portion to a greater extent than said central portions of the sheet to a sufficient degree to impart resistance to kinking in the longitudinal side edge portion.

4,074,996

METHOD OF AND APPARATUS FOR BENDING GLASS SHEETS

Floyd T. Hagedorn, Oregon; Donald D. Rahrig, and Robert G. Revells, both of Toledo, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed July 28, 1976, Ser. No. 709,332
Int. Cl.[2] C03B 23/02
U.S. Cl. 65—106 25 Claims



1. A method of bending a glass sheet comprising: heating a glass sheet substantially to the softening point thereof, supporting said heat-softened sheet on a press member having a shaping surface, superheating the heat-softened sheet along a line about which it is desired to sharply bend the sheet, and holding said sheet adjacent said line against said shaping surface while applying a bending moment to a portion of the glass sheet to bend such portion about said line.

10. Apparatus for bending glass sheets comprising: means for heating a glass sheet substantially to the softening point thereof, means for superheating the heat-softened sheet substantially above the softening point thereof along a line about which it is desired to sharply bend the sheet, means including a shaping surface for bending said sheet, means for holding the major portion of said sheet against said shaping surface, said bending means including means engageable with a portion of said glass sheet for applying a bending moment thereto to bend such portion about said line relative to said held major portion of said sheet.

4,074,997

PLANT PLUG

Merrill Cohen, 3418 Edcrest Road, Baltimore, Md. 21207

Filed June 17, 1976, Ser. No. 697,028
Int. Cl.[2] C05F 11/02
U.S. Cl. 71—24 4 Claims

1. A weighted water-retaining, non-rigid, open-cell, substantially homogeneous polyurethane-foam/soil composition comprising moisture and a plant food enriched admixture of loam, clay, peat moss and builders' sand integrally incorporated as filler in sufficient water-cured hydrophilic-polyurethane-prepolymer foam to sustain the composition as an integral solid which has a sufficiently-high average density to preclude its floating in water.

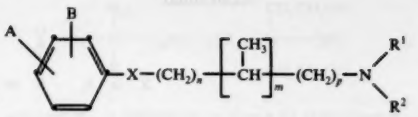
4,074,998

METHOD OF CONTROLLING AQUATIC WEEDS

William B. Lacefield, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 719,308, Aug. 31, 1976, abandoned. This application Mar. 31, 1977, Ser. No. 783,124
Int. Cl.[2] A01N 9/24
U.S. Cl. 71—66 9 Claims

1. A method of destroying aquatic weeds in water which comprises contacting the weeds with an herbicidally-effective amount of a compound of the formula



wherein

A is hydrogen, bromo, or chloro;

B is cyclohexyl, benzyl, or phenyl;

X is oxygen or sulfur;

m is 0 or 1;

when $m = 0$, $n + p$ is 2 through 10; and

when $m = 1$, $n = p = 1$, or $n = 2$, $p = 0$;

R^1, when taken alone, is hydrogen, C_1-C_5 alkyl, or $-CH_2CH_2OH$;

R^2, when taken alone, is hydrogen, C_1-C_5 alkyl, C_3 alkenyl, cyclohexyl, $-CH_2CH_2OH$, $-(CH_2)_3OCH_3$, 1-adamantyl, or phenyl;

R^1 and R^2, when taken together with the nitrogen atom to which they are attached, form morpholino, 2-methylpiperidino, 4-(2-hydroxyethyl)piperazino, or pyrrolidino; and

the acid addition salts thereof.

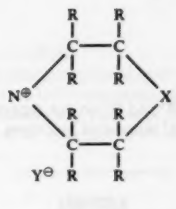
4,074,999

USE OF CYCLIC THIAZINES AS MICROBIOCIDES

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

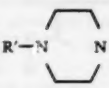
Division of Ser. No. 119,387, Feb. 26, 1971, Pat. No. 3,770,732. This application May 29, 1973, Ser. No. 364,747
Int. Cl.[2] A01N 9/22
U.S. Cl. 71—67 10 Claims

1. The process of inhibiting and controlling the growth of microbiological organisms selected from the group consisting of bacteria, fungi, algae and protozoa in aqueous or petroleum hydrocarbon media which comprises adding to said media a microbiocidal quantity of a quaternary bicyclic compound of the formula

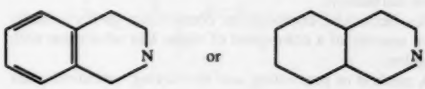


where N is

where Z is O,S, S←O or O←S→O, or



where R′ is lower alkyl, or hydroxyloweralkyl,



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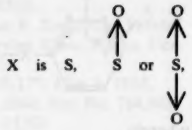


Y is a halide, sulfate, phosphate, nitrate, perchlorate or methane sulfonate, ethyl sulfonate or benzyl sulfonate, and the R's are hydrogen or lower alkyl.

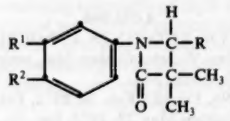
4,075,000

HERBICIDAL USE OF 4-AMINO-3,3-DIMETHYL-1-PHENYL-2-AZETIDINONES

Riaz F. Abdulla, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed May 27, 1975, Ser. No. 581,017
Int. Cl.[2] A01N 9/22
U.S. Cl. 71—88 **7 Claims**

1. A method of reducing the vigor of unwanted herbaceous plants which comprises contacting the plants with an herbicidally-effective amount of a compound of the formula



wherein
R represents
dimethylamino,
diethylamino, or
morpholino;
R^1 and R^2 independently represent
hydrogen,
methyl,
chloro,
fluoro,
methoxy,
methylthio, or
trifluoromethyl;
provided that both R^1 and R^2 do not represent hydrogen, and that neither R^1 nor R^2 represents hydrogen when R represents morpholino.

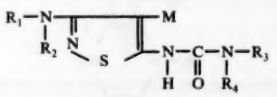
4,075,001

3-AMINOISOTHIAZOLE DERIVATIVES AS HERBICIDES

Loren Kenneth Gibbons, Medina, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Filed June 18, 1976, Ser. No. 697,449
Int. Cl.[2] C07D 275/02; A01N 9/12
U.S. Cl. 71—90 **17 Claims**

1. A substituted isothiazolylurea of the formula



in which R_1 and R_2 are alkyl, or taken together form a tetramethylene radical; R_3 is alkyl; R_4 is alkyl or hydrogen; M is cyano or carbamoyl.

16. An herbicidal composition comprising an herbicidally effective amount of a compound of claim 1 in admixture with an extender.

17. A method of preventing and destroying undesired plant growth which comprises applying to the locus to be protected an herbicidally effective amount of a compound of claim 1.

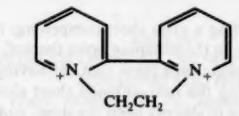
4,075,002

HERBICIDAL COMPOSITIONS HAVING IMPROVED STABILITY

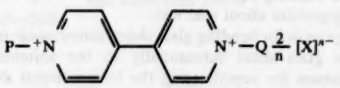
Nigel Wyndham Drewe, Maidstone; Roger John Parker, Tonbridge, and Tharwat Fouad Tadros, Wokingham, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 15, 1973, Ser. No. 323,396
Claims priority, application United Kingdom, Jan. 28, 1972, 4042/72
Int. Cl.[2] A01N 9/22
U.S. Cl. 71—92 **8 Claims**

1. A herbicidal composition having improved storage characteristics, comprising an effective amount of a solid herbicide dispersed in an aqueous solution of a herbicidal bipyridylium quaternary salt selected from the group consisting of compounds of the formula:

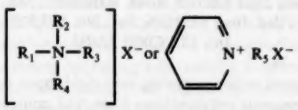


and



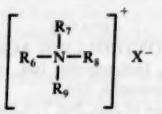
wherein P and Q are selected from the group consisting of alkyl radicals of 1 to 4 carbon atoms and alkyl radicals of 1 to 4 carbon atoms substituted by a radical selected from the group consisting of hydroxyl, halogen, carboxyl, alkoxy, alkylcarbonyl, carbamoyl or N-substituted carbamoyl; $[X]^{n-}$ represents an anion and n is a integer from 1 to 4 inclusive, the solid herbicide having an average particle size not exceeding 50 microns; and a dispersing agent selected from the group consisting of (A)

(i) quaternary ammonium salts of the formula:



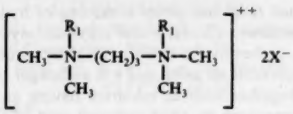
wherein R_1 and R_5 are aliphatic, preferably alkyl groups of from 8 to 18 carbon atoms and R_2, R_3 and R_4 are aliphatic, preferably alkyl, groups of less than 8 carbon atoms, R_2 may also be a benzyl group, and Y is an anion

(ii) quaternary salts of the formula:



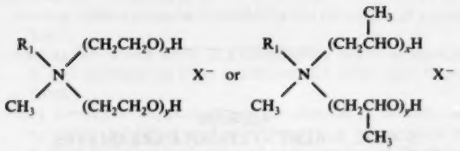
wherein R_6 and R_7 are aliphatic, preferably alkyl, groups of from 8 to 18 carbon atoms, R_8 and R_9 are aliphatic, preferably alkyl groups of less than 8 carbon atoms, and X is a anion

(iii) quaternary salts of formula:



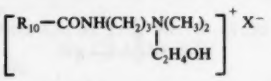
wherein R_1 and X are as defined in clause (i) above

(iv) quaternary salts of the formula:



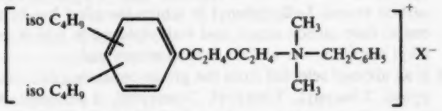
wherein R_1 and X^- are defined as in clause 1 above, and x and y each represent an integer from 2 to 23 inclusive;

(v) quaternary salts of formula:



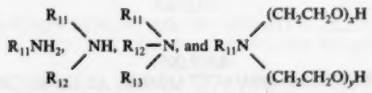
wherein R_{10} is an aliphatic, preferably alkyl group of 8 to 18 carbon atoms and X is an anion;

(vi) quaternary salts of formula:



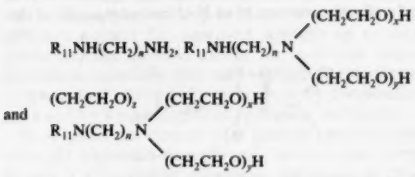
wherein X is an anion; and (B)

(i) acid addition salts of amines of the formula:



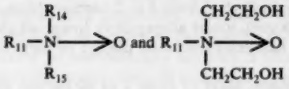
wherein R_{11}, R_{12}, and R_{13} represent saturated or unsaturated aliphatic groups of from 8 to 18 carbon atoms, or represent mixtures of such saturated or unsaturated aliphatic groups and x and y each represent an integer of from 2 to 23;

(ii) acid addition salts of diamines of formula:



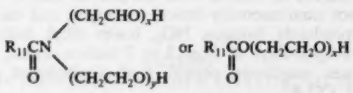
wherein R_{11}, x and y are defined as in clause (i) above, n is 2 or 3, and z is an integer of from 2 to 23

(iii) acid addition salts of amine oxides of formula:



wherein R_{11} is defined as in clause (i) above and R_{14} and R_{15} are aliphatic, preferably alkyl, groups of less than 8 carbon atoms;

(iv) compounds of formula:



wherein R_{11}, x and y are defined as in clause (i) above.

4,075,003

NOVEL HERBICIDAL METHOD UTILIZING 1,4-DIPHENYL-3-PYRAZOLIN-5-ONES

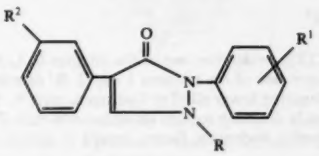
James Richard Beck, and Robert Peter Gajewski, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 639,744, Dec. 11, 1975, abandoned. This application Sept. 20, 1976, Ser. No. 724,502

Int. Cl.² A01N 9/22

U.S. Cl. 71—92 **12 Claims**

1. A method of reducing the vigor of weeds which comprises contacting the weeds with an herbicidally-effective amount of a compound of the formula



wherein

R represents C_1-C_3 alkyl;

R^1 and R^2 independently represent hydrogen, chloro, fluoro, bromo, methyl or trifluoromethyl, provided that R^1 and R^2 do not simultaneously represent hydrogen;

and provided that R^1 may not be bromo or chloro in the 4-position.

4,075,004

2,1,3-BENZOTHIADIAZINES

Gerhard Hamprecht, Mannheim; Ulrich Schirmer, Heidelberg; Bruno Wuerzer, Limburgerhof, and Guenter Retzlaff, Roemerberg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

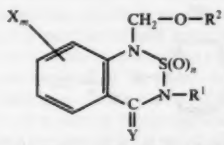
Filed Oct. 18, 1976, Ser. No. 733,524

Claims priority, application Germany, Nov. 27, 1975, 2553209

Int. Cl.² C07D 285/16; A01N 9/14

U.S. Cl. 71—91 **3 Claims**

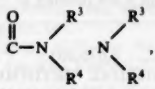
2. A process for controlling the growth of unwanted plants, wherein the soil or the plants are treated with a compound of the formula



V.

where R^1 is hydrogen, alkyl of from 1 to 7 carbon atoms, lower haloalkyl, cycloalkyl of from 3 to 7 carbon atoms, lower alkenyl, lower alkynyl, lower alkoxyalkyl, lower alkylmercaptoalkyl, phenyl, halogen-substituted phenyl or methyl-substituted phenyl;

R^2 is hydrogen, alkyl of from 1 to 20 carbon atoms, lower haloalkyl, cycloalkyl of from 3 to 7 carbon atoms, lower alkenyl, lower alkynyl, lower haloalkenyl, lower haloalkynyl, lower alkoxyalkyl, lower alkylmercaptoalkyl, lower alkylcarbamoylalkyl, lower dialkylcarbamoylalkyl, lower alkoxycarboalkyl, lower alkoxycarboalkenyl, lower alkylketone or benzyl, with the proviso that R^1 and R^2 cannot simultaneously denote hydrogen; and each X is independently halogen, NO_2, lower alkyl, halo lower alkyl, cycloalkyl of from 3 to 7 carbon atoms, phenyl halogen substituted phenyl, methyl-substituted phenyl, SCN, CO_2R^3,



NH_2, $Y''R^4$, SO_2R^3, SO_2OR^3,

CCl_3, CF_3,

or $Y'CF_2C(Z)_3$, m denotes one of the integers 0, 1, 2, 3 and 4, and n denotes one of the integers 1 and 2, R^3 denoting lower alkyl, R^4 denoting lower alkyl or hydrogen, each Y, Y' and Y'' independently denoting oxygen or sulfur, and each Z independently denoting hydrogen, fluoro, bromo or chloro.

4,075,005

HERBICIDAL COMPOSITIONS

David Alan Knowles, Tonbridge, and Clive Gilroy Robson, Staplehurst, both of England, assignors to Imperial Chemical Industries Limited, London, England

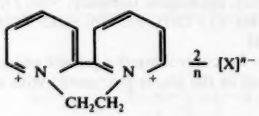
Filed Dec. 27, 1976, Ser. No. 757,912

Claims priority, application United Kingdom, Jan. 20, 1976, 2174/76

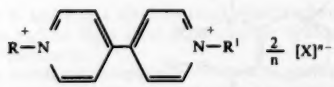
Int. Cl.² A01N 9/22

U.S. Cl. 71—94 **7 Claims**

1. A concentrated herbicidal composition, comprising an aqueous solution having a pH not greater than 5, of a herbicidally effective amount of a salt of a herbicidal bipyridylium quaternary cation selected from the group consisting of compounds of the formula:



or



wherein R and R^1 are selected independently from the group consisting of alkyl radicals of from 1 to 4 carbon atoms and alkyl radicals of from 1 to 4 carbon atoms substituted by a radical selected from the group consisting of hydroxy, halogen, carboxyl, lower alkoxy, lower alkylcarbonyl, lower alkoxycarbonyl, carbamoyl or N-lower alkyl substituted carbamoyl; $[X]^{n-}$ represents an anion and n is an integer of from 1 to 4 inclusive; together with an odourant having an unpleasant smell and comprising an alkyl carboxyl acid of the formula RCOOH wherein R is a straight or branched chain alkyl group containing from three to five carbon atoms, said odourant being present in amount sufficient to warn that the composition is not a beverage suitable for drinking.

4,075,006

S-ARYL N-ALKYNYLTHIOLCARBAMATES

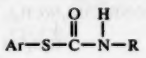
Jay K. Rinehart, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 30, 1976, Ser. No. 710,057

Int. Cl.² A01N 9/12; C07C 155/08

U.S. Cl. 71—100 **18 Claims**

1. A composition represented by the general formula:



wherein:

Ar is an aryl selected from the group consisting of phenyl, 4-chlorophenyl, 4-bromophenyl, 4-fluorophenyl, 3,4-dichlorophenyl, 4-nitrophenyl, 3-alkoxyphenyl in which the alkoxy has from one to four carbon atoms, 4-alkoxyphenyl in which the alkoxyphenyl has from one to four carbon atoms, 3-alkylphenyl in which the alkyl has from one to four carbon atoms, and 4-alkylphenyl in which the alkyl has from one to four carbon atoms, and

R is an alkynyl selected from the group consisting of 2-propynyl, 2-butynyl, 3-butynyl, 2-pentynyl, 3-pentynyl, 4-pentynyl, 1-methylprop-2-ynyl, 1-ethylprop-2-ynyl, 1-methylbut-2-ynyl, and 1,1-dimethylprop-2-ynyl.

4,075,007

N-CHLORO-CHLOROACETAMIDES AS HERBICIDES

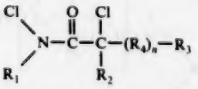
Sol J. Barer, Plainsborough, and Richard F. Stockel, Bridgewater Township, Middlesex County, both of N.J., assignors to National Patent Development Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 450,461, March 12, 1974, abandoned. This application May 17, 1974, Ser. No. 471,062

Int. Cl.² A01N 9/20

U.S. Cl. 71—118 **27 Claims**

1. A process for destroying undesired vegetation comprising treating the growing medium containing the vegetation with a herbicidally effective amount of an N-chloro compound of the formula



where R_1 is hydrogen or alkyl of 1 to 6 carbon atoms, R_4 is alkylene or chloroalkylene of 1 to 5 carbon atoms, n is 0 or 1, R_2 and R_3 are hydrogen, chlorine, alkyl of 1 to 4 carbon atoms, aralkyl of up to 8 carbon atoms or aryl of up to 8 carbon atoms.

4,075,008

METHOD FOR THE RECLAMATION OF ZINC FROM GALVANIZING BATHS

Ralph William Leonard, Pittsburgh, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 4, 1977, Ser. No. 784,004
Int. Cl.[2] C22B 19/30
U.S. Cl. 75—86 5 Claims

1. In the liquation process for the recovery of Zn entrained in dross removed from Zn base melts, the improvement for recovering said entrained Zn in a form essentially uncontaminated by high melting point, intermetallic compounds, said improvement comprising,

pouring molten dross into a mold for the formation of a dross ingot,

cooling the molten dross to a temperature below about 420° C and sufficient to form a substantially solid ingot therefrom,

on a permeable support and in the absence of detrimental agitation, reheating said solid ingot to a temperature of 420° to 700° C to melt-out said uncontaminated Zn therefrom.

4,075,009

NICKEL BASE BRAZING ALLOY

Marvin J. Stern, Seattle, Wash., assignor to Alloy Metals, Inc., Troy, Mich.

Filed Apr. 30, 1976, Ser. No. 681,957
Int. Cl.[2] C22C 19/03
U.S. Cl. 75—170 10 Claims

1. A low temperature brazing alloy particularly suitable for brazing carbon and low alloy steels, nickel alloys, copper alloys and stainless steels, consisting essentially of, by weight,

manganese: 19 to 23%
silicon: 5 to 8%
copper: 4 to 6%
boron: 0.6 to 1.8%
rare earth: 0.01 to 0.2%
tantalum: 0 to 3%
molybdenum: 0 to 3%
columbium: 0 to 3%,
tungsten: 0 to 3%
aluminum: 0 to 3%
carbon: up to 0.06%
nickel: Balance

4,075,010

DISPERSION STRENGTHENED FERRITIC ALLOY FOR USE IN LIQUID-METAL FAST BREEDER REACTORS (LMFBRS)

John Joseph Fischer, Suffern, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Feb. 5, 1976, Ser. No. 655,463
Int. Cl.[2] B22F 3/00
U.S. Cl. 75—235 17 Claims

1. As a powder metallurgy article of manufacture, a structural element of a LMFB reactor comprising a wrought dispersion-strengthened, heat resistant ferritic alloy having a composition consisting essentially of, by weight, about 13% to about 25% chromium, about 0.2% to less than 2% titanium, up to about 2% molybdenum, up to about 2% aluminum, a small but effective amount for improved strength up to about 1.5% yttria and the balance, except for incidental elements and impurities, essentially iron, said wrought ferritic element being characterized substantially throughout by composition uniformity and by a high degree of dispersion uniformity.

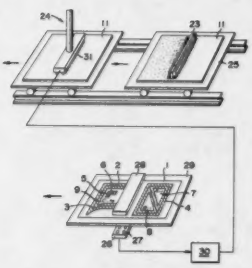
9. A structural element of a nuclear reactor comprising a wrought dispersion-strengthened, heat resistant ferritic alloy having a composition consisting essentially of, by weight, about 13% up to less than about 16% chromium, about 0.2% to about 1.5% titanium, up to about 1% Mo, a small but effective amount for improved strength up to about 0.75% of a refractory stable compound selected from the group metal oxide, metal nitride and metal carbide, and the balance, except for incidental elements and impurities, essentially iron, said element being prepared as a powder metallurgy product by the steps comprising a) mechanically alloying a mixture of fine powder containing components of said alloy in amounts proportional to give said composition, b) consolidating the resultant mechanically alloyed powder and effecting at least 25% reduction in area; thereby producing a dispersion-strengthened heat resistant ferritic alloy having a 100-hour stress-rupture life at 650° C of at least 40 ksi.

4,075,011

ELECTROSTATIC POWDER COATING METHOD

Masakazu Iwasa, Tokyo; Kazuo Horikawa, Asaka, and Seiji Matsumoto, Asaka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 12, 1974, Ser. No. 532,226
Claims priority, application Japan, Dec. 12, 1973, 48-139865
Int. Cl.[2] G03G 13/22
U.S. Cl. 96—1 R 11 Claims



1. A method of selectively applying electrostatic coating powder to a plate in a pattern to form an uncoated area on the plate on the surface of which marking lines are to be printed by an electrophotographic print marking process comprising the steps of, providing an optical original having recorded thereon both marking information in a linear form and non-coating information in a form corresponding to areas on a plate to remain uncoated with the electrostatic coating powder, said marking information and said non-coating information on said optical original having different spectral transmittance or reflectance, electrophotographically printing on the plate marking lines corresponding to said marking information using said optical original comprising the steps of uniformly applying photoconductive powder on the plate, uniformly charging the photoconductive powder applied on the plate, exposing portions of the charged photoconductive powder on the plate to imagewise light in accordance with the marking information on said optical original to neutralize the charge of the exposed portions of the photoconductive powder on the plate, and removing the exposed portions of the photoconductive powder from the plate, the charge of which has been neutralized, from the surface of the plate, and fixing the unexposed portions of the photoconductive powder, uniformly applying a layer of electrostatically charged coating powder on the plate, detecting the non-coating information on said optical original with photodetecting means to provide an output signal, selectively removing portions of said layer of coating powder from the plate by air flow by controlling a powder removal means with the output signal of the photo detecting means to form said uncoated areas on the plate corresponding to the non-coating information carried by the optical original and fixing the remaining portions of the layer of coating powder on the plate to the surface thereof.

4,075,012
INTRACHAIN CHARGE TRANSFER COMPLEXES USE IN ELECTROPHOTOGRAPHIC IMAGING

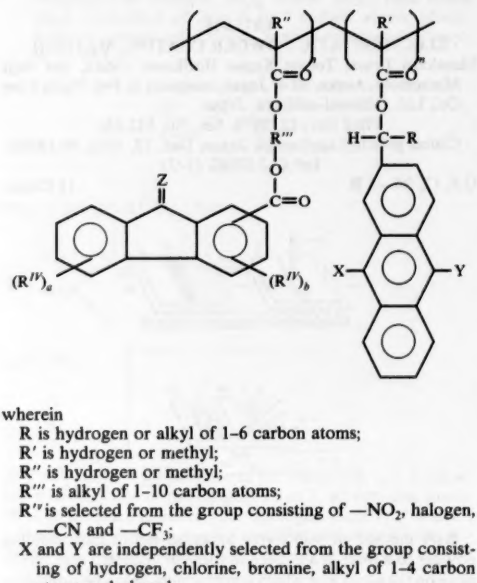
Sam R. Turner, Webster, and Milan Stolka, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 596,532, July 16, 1975, Pat. No. 4,013,623. This application Aug. 20, 1976, Ser. No. 716,309

Int. Cl.[2] G03G *1/00*

U.S. Cl. 96—1 PC **12 Claims**

1. The electrophotographic imaging member comprising a photoconductive insulating layer containing a copolymer of the formula



wherein

R is hydrogen or alkyl of 1–6 carbon atoms;

R′ is hydrogen or methyl;

R″ is hydrogen or methyl;

R‴ is alkyl of 1–10 carbon atoms;

R^{IV} is selected from the group consisting of $—NO_2$, halogen, —CN and $—CF_3$;

X and Y are independently selected from the group consisting of hydrogen, chlorine, bromine, alkyl of 1–4 carbon atoms and phenyl;

Z is oxygen or dicyanomethylene;

a and *b* are in the range of from 0–4;

n is in the range of from about 5 to about 95 percent of the total number of structural units of the copolymer; and

m is in the range of from about 5 to about 95 percent of the total number of structural units of the copolymer.

4,075,013
ELECTROPHOTOCHEMICAL PREPARATION OF SELENIUM PHOTOCONDUCTIVE MEMBERS

Anthony T. Ward, 934 Little Pond Way, Webster, N.Y. 14580; Aleksandar Damjanovic, 809 Harbor Square, Rochester, N.Y. 14617, and Michael L. Hair, 2367 Bennington Gate, Oakville, Ontario, Canada (L6J 5N7)

Filed Sept. 13, 1976, Ser. No. 722,914

Int. Cl.[2] G03G *5/04*

U.S. Cl. 96—1.5 R **7 Claims**

1. A method for forming an electrophotographic imaging member comprising a conducting substrate, a layer of amorphous selenium having a periodically varying thickness and a layer of a charge carrier transport material capable of transporting at least one species of charge carrier comprising:

a. cathodically depositing a layer of amorphous selenium on a conducting substrate from a selenious acid electrolyte while simultaneously illuminating said substrate with a periodic spatially modulated pattern of electromagnetic radiation within the absorption band of selenium whereby said selenium layer has a periodically varying thickness which corresponds to said periodic spatially modulated pattern; and

b. overcoating said selenium layer with a layer of a charge carrier transport material which is capable of transporting at least one species of charge carrier.

4,075,014
COLOR PICTURE DEVELOPMENT PROCESS

Wolfgang Gerhardt, Lutjenmoor, Germany, assignor to Tetenal Photowerk Walter Grabig, Schutzenwall, Germany

Continuation-in-part of Ser. No. 361,425, May 18, 1973, abandoned. This application Feb. 12, 1976, Ser. No. 657,486

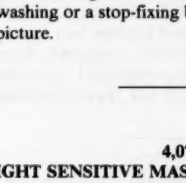
Claims priority, application Germany, Mar. 17, 1973, 2313310

Int. Cl.[2] G03C *7/16, 5/32, 5/30*

U.S. Cl. 96—22 **8 Claims**

1. A color-positive process for producing a color surface picture using an image exposed color paper having diffusion-resistant and protected color couplers or plastic-coated or plastic-uncoated color paper of color negatives, the steps comprising:

color developing the picture at a temperature in the range of from about 20° C to about 50° C with a paraphenylene diamine developer having added thereto a development accelerator having the formula:



wherein R_1 and R_2 are H, CH_3, or $CH_2—CH_3$ and *n* is in the range of 1 to 4;

bleach fixing and stabilizing the picture in a solution including ethylene-diamine tetraacetic acid iron-sodium complex, ammonium thiosulfate and sodium sulfite, said solution having a pH of from about 5.5 to about 6.0, said process being carried out without any intermediate step of washing or a stop-fixing bath; and thereafter, washing the picture.

4,075,015
LIGHT SENSITIVE MASS AND PROCESS FOR ITS PRODUCTION

Josef Vinkovic, Tagerwilen, and Eugen Werner, Kreuzligen, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Aug. 16, 1976, Ser. No. 714,896

Claims priority, application Switzerland, Aug. 14, 1975, 010576/75

Int. Cl.[2] G03C *5/00, 1/52, 1/58*

U.S. Cl. 96—35.1 **28 Claims**

1. A process for the production of a light-sensitive material which comprises applying a light sensitive composition containing (a) a film former, which consists of 20 to 90 percent by weight of a vinyl pyrrolidone-vinyl acetate copolymer or a polyvinyl pyrrolidone or both and 10 to 80 percent by weight of an aryl sulfone amide formaldehyde resin, and (b) at least one sensitizer, the weight ratio of said film former to said sensitizer being between 1:1 and 10:1, said sensitizer being selected from the group consisting of a tanning diazo compound, a phenyl diazo compound, a 1,3-diphenyl triazo compound, 4,4′-diazidostilbene, 4,4′-diazidostilbene-2,2′- disulfonic acid, 4,4′-diazidostilbene-3,3′-disulfonic acid, a UV-hardenable short oil alkyd resin and 1,3-di-p-tolyl-3-methyl triazene, and said sensitizer being dissolved in (c) an organic solvent, to a carrier in the form of a layer, and drying said light sensitive layer applied to said carrier.

4,075,016

POSITIVE-WORKING PHOTOGRAPHIC PROCESS AND RADIATION ELEMENTS UTILIZING A CHALCOGENIDE OF ARSENIC IMAGING COMPOUND AND A NOBLE PLATING METAL

Atanas Tzvetanov Burov; Penka Atanassova Simidchieva, and Konstantin Nikolaev Kolev, all of Sofia, Bulgaria, assignors to Ziafop pri Ban, Sofia, Bulgaria

Filed Jan. 6, 1976, Ser. No. 646,934

Claims priority, application Bulgaria, Jan. 7, 1975, 2867

Int. Cl.[2] G03C *5/24, 1/48*

U.S. Cl. 96—48 PD **37 Claims**

1. A method for the production of a direct positive metal image which comprises exposing an element comprising a thin radiation sensitive layer of an amorphous chalcogenide of arsenic adhering to a carrier therefor to radiation through a photomask to form a latent positive image, the radiation being such as to render chalcogenide impinged on thereby incapable of reducing a noble metal salt to form a deposit of the noble metal and immersing the element in a solution of a noble metal salt to deposit said noble metal in non-irradiated areas to obtain thereby a direct image rendered visible by means of said noble metal.

27. A radiation sensitive element for use in the production of a direct positive metal image when exposed to radiation through a photomask and immersed in water, which comprises a substrate having adhering thereto a thin radiation sensitive layer of an amorphous chalcogenide of arsenic which is covered in turn by a layer of a water permeable organic material and by a layer of a water-soluble organic polymer containing a noble metal salt, the radiation sensitive layer being accessible to radiation from one or both sides thereof.

4,075,017

PHOTOTHERMOGRAPHIC MATERIAL CONTAINING A COMBINATION OF ENERGY-SENSITIVE ORGANIC DYES AND PROCESS OF FORMING A POSITIVE OR NEGATIVE IMAGE WITH THE MATERIAL

Charles A. Goffe, deceased, late of Brockport, N.Y., by Patricia Anne Goffe, executrix, and Donald W. Heseltine, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 24, 1976, Ser. No. 689,325

Int. Cl.[2] G03C *5/24, 3/26*

U.S. Cl. 96—48 HD **45 Claims**

1. A non-silver halide photothermographic element comprising a support having thereon a layer comprising

a) an oxidation-reduction image-forming combination comprising

i) a non-radiation sensitive reducing agent and

ii) an organic acid silver salt oxidizing agent,

b) a binder, and

c) a combination of energy-sensitive organic dyes which upon exposure to actinic radiation catalyze the reduction of the silver compound to metallic silver said combination comprising

(i) a photosensitive reducing agent precursor having an o-nitro substituted aryl group joined through a methine chain linkage to a basic heterocyclic nucleus containing an electron-donating nitrogen, oxygen or sulfur atom, and

(ii) a photosensitive dye containing a heterocyclic nitrogen atom which is substituted by a member selected from the group consisting of an alkoxy group and an acyloxy group.

4,075,018

MOTION PICTURE FILM, SOUNDTRACK AND METHOD FOR PRODUCTION THEREOF

Peter Anderson Custer, Newtown, Bucks County, Pa. 18940

Continuation-in-part of Ser. No. 375,812, July 2, 1973, Pat. No. 3,926,633. This application June 9, 1975, Ser. No. 585,164

Int. Cl.[2] G03C *5/14, 1/76, 1/84*

U.S. Cl. 96—39 **26 Claims**

1. A method for making an unexposed film containing a visual or photographic image portion and a sound image portion which comprises:

1. forming the film by coating a flexible transparent base with at least one silver halide-containing photographic image-forming layer;

2. adding to the film a screening or blocking layer which absorbs the radiation of at least a given portion of the light spectrum and which is optically transparent after the development of the film;

3. adding to the film a separate silver halide-containing optical soundtrack image-forming layer overlying at least a portion of said photographic layer, whereby the soundtrack images will overlie the photographic images;

4. said soundtrack image forming layer containing:

a. from 0 to a relatively small amount of a sensitizing material effective to sensitize said soundtrack image-forming layer to the said given portion of the light spectrum as is absorbed in the screening or blocking layer; and

b. a relatively small amount of a material which fluoresces under UV light;

5. the said screening or blocking layer being interposed between the said photographic and soundtrack layers.

4,075,019

HIGH GAIN COBALT(III)COMPLEX COMPOSITION AND ELEMENT

Thap DoMinh, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 461,172, April 15, 1974, abandoned. This application Oct. 30, 1975, Ser. No. 627,416

Int. Cl.[2] G03C *1/72*

U.S. Cl. 96—88 **9 Claims**

1. An image-forming element exhibiting upon exposure on internal gain and comprising a support and, as a coating thereon, a radiation-sensitive layer comprised of, in admixture,

a cobalt(III)complex which is a hexa-ammine cobalt(III), penta-ammine cobalt(III), bis(ethylenediamine) cobalt(III), tris(ethylenediamine cobalt(III), bis(propylene) cobalt(III), tris(propylene) cobalt(III), bis(dimethylglyoxime) cobalt(III), cobalt(III) acetylacetonate or bis(2,2'-bipyridyl) cobalt(III) complex and

a compound containing a conjugated π-bonding system capable of forming a tridentate chelate with cobalt(III), said compound being a 1-(2-pyridyl, 2-quinolinly, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl) formazan dye; a 1-(2-pyridyl, 2-quinolinyl, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl)-azo-2-(phenol or naphthol); 2-pyridinecarboxylaldehyde-(2-pyridyl, 2-quinolinyl, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl) hydrazone; or 1-(2-pyridyl, 2-quinolinyl, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl)-dithiooxamide;

less than 50 mole percent of any acid anions of said coating being those having pKa values greater than 3.5.

4,075,020
PROCESS FOR THE PREPARATION OF SILVER HALIDE EMULSIONS

Wilhelm Saleck, Schildgen, and Harald von Rintelen, Leverkusen, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed July 22, 1976, Ser. No. 707,812
Claims priority, application Germany, July 30, 1975, 2534011
Int. Cl.[2] G03C *1/02, 1/28*
U.S. Cl. 96—94 R **5 Claims**

1. A process of producing a silver halide emulsion comprising the step of precipitating silver halide by reacting an aqueous solution of a silver salt with an aqueous halide solution in the presence of a hydrophilic binder, wherein the improvement comprises

a. reacting from 5 to 30% of the total amount of soluble silver salt with a soluble chloride composition to form silver halide particles comprising silver chloride having a first solubility product, and

b. precipitating onto said particles further silver halide and simultaneously converting at least part of the silver chloride particles to a silver bromide selected from the group consisting of silver bromide, silver iodobromide, silver chlorobromide and silver chloroiodobromide having a second solubility product which is lower than said first solubility product when the solubility products of the respective halides are determined at the same constant temperature, by reacting in the presence of said silver chloride particles the residual amount of soluble silver salt with a composition selected from the group consisting of soluble chlorides, bromides and iodides containing the halide that forms the silver bromide having a second solubility product wherein, in the precipitation medium at least transitorily during said precipitation the quantity of the halide which forms the silver bromide with the second solubility product is less than equivalent to the quantity of silver ions by at least 5% and the total concentration of the added halide ions is greater than the total concentration of added silver ions by at least 5%,

such that the silver bromide comprises from 40 - 100 mol% of the silver halide and the silver chloride comprises from 0 - 60 mol% of silver halide and the silver iodide comprises 0 -15 mol % of the silver halide.

4,075,021
PHOTOSENSITIVE MATERIAL FOR COLOR PHOTOGRAPHY

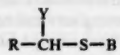
Shoji Kikuchi; Takaya Endo; Teruo Kagami, and Ryosuke Sato, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1975, Ser. No. 625,043
Claims priority, application Japan, Oct. 25, 1974, 49-123105
Int. Cl.[2] G03C *1/06, 5/32, 7/16*
U.S. Cl. 96—95 **17 Claims**

1. A silver halide photosensitive material for color photography comprising a bleach-promoting substance releasing compound upon reacting with an oxidation product of a color developing agent, said bleach-promoting substance-releasing compound being represented by the following general formulas:

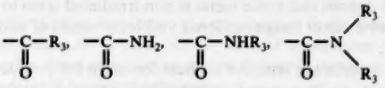
I

wherein Z is a group of non-metallic atoms necessary for forming a 5-, 6- or 7-membered saturated or unsaturated carbon ring or nitrogen, oxygen, or sulfur containing heterocyclic ring wherein said carbon ring and said carbon ring and said heterocyclic ring may be substituted with at least one member selected from the group consisting of alkyl, aryl, alkoxy, aryloxy, halogen and a group-SB, in which ring the two substituents can form a condensed ring, X is hydrogen or halogen, and B is a group capable of forming, together with the sulphur atom, a heterocyclic mercapto compound selected from the group consisting of 1H-2-mercaptotetrazole, 3-mercapto-1,2,4-triazole, 3-mercapto-4-phenyl-5-amino-1,2,4-triazole, mercapto imidazoline, mercapto pyrimidine, mercapto purine, mercapto quinolidine and 2-mercapto-5-amino-1,4,5-thiadiazole, or:



II

wherein Y is a halogen or a group —OR_1 or —$COOR_2$ in which R_1 is alkyl, aryl, acyl or heterocyclic group, R_2 is alkyl, R is a group



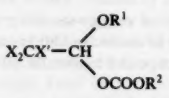
or —COR_4 in which R_3 is alkyl, aryl, or a heterocyclic group with the proviso that in the case of a group having two R_3s, two R_3s can jointly form a nitrogen-containing ring and R_4 is alkyl, and B is as defined in the general formula I.

4,075,022
AQUEOUS DISPERSIONS OF PHOTOGRAPHIC INGREDIENTS

Leo August Van Wignsberghe, deceased, late of 's-Gravenwezel, Belgium, by Agnes Maria Zinzen, heir, Fazantenlaan 13, B 2232 's-Gravenwezel, Belgium; Raphael Karel Van Poucke, Ringlaan 22, B 2600 Berchem, Belgium, and Jaak Pieter Van Vugt, Esmoreitlaan 3, B 2050 Antwerpen, Belgium

Filed Apr. 5, 1976, Ser. No. 673,370
Claims priority, application United Kingdom, Apr. 3, 1975, 13784/75
Int. Cl.[2] G03C *1/40, 1/02*
U.S. Cl. 96—100 R **25 Claims**

10. Method of forming a hydrophilic colloid composition wherein a carbonate of the formula:



wherein:

X represents a halogen atom

X′ represents a hydrogen atom or a halogen atom, and each of R^1 and R^2 represents an alkyl group or an aryl group, is added to an aqueous solution of the hydrophilic colloid.

15. Method according to claim 10, wherein a photographic ingredient is also added to the aqueous solution of hydrophilic colloid.

4,075,023
POLYMERIZABLE UNSATURATED OXAZOLIDINES AND TETRAHYDRO-1,3-OXAZINES AND POLYMERS THEREOF

Jan Josef Priem, Mortsel, and Walter Frans De Winter, Berchem, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

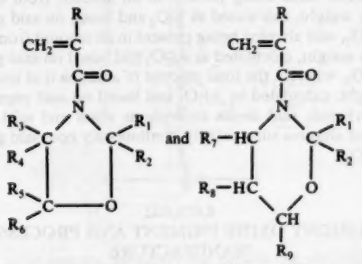
Filed Dec. 19, 1972, Ser. No. 316,511

Claims priority, application United Kingdom, Dec. 20, 1971, 59034/71

Int. Cl.² G03C 1/72

U.S. Cl. 96—114 **4 Claims**

1. A gelatin layer comprising gelatin and up to 50% by weight of the amount of dry gelatin present of a homopolymer of a vinyl monomer corresponding to one of the general formulae:



wherein:

R represents hydrogen or methyl,

R_1 is a C_1–C_4 alkyl group and R_2 is a C_1–C_4 alkyl group or a phenyl group, each of R_3, R_4, R_5 and R_6 represents a hydrogen atom, a methyl group, or an ethyl group, and

each of R_7, R_8 and R_9 represents a hydrogen atom or a methyl group.

4,075,024
COLORED GLASSES AND METHOD

William H. Armistead, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 19, 1976, Ser. No. 715,989

Int. Cl.² C03C 3/10, 3/08

U.S. Cl. 106—53 **4 Claims**

1. A colored glass article composed of a borosilicate glass having a composition consisting essentially, in weight percent as calculated from the batch, of about 5–21% B_2O_3, 35–75% SiO_2, 5–50% total of bivalent metal oxides selected in amounts not exceeding the indicated proportion from the group consisting of up to 50% PbO, 15% ZnO, and 5% BaO, 0.5–1.5% of a silver compound, 1–4% Sb_2O_3, 0–9% Na_2O, 0–2% F, and 0–1% P_2O_5, said glass comprising in at least a portion thereof a separated, glassy, boron-rich phase and a coloring metallic silver phase associated with said separated glassy, boron-rich phase, said glass article exhibiting at least one absorption color selected from the group consisting of orange, red, purple, blue, green, and mixtures thereof.

4,075,025
METHOD OF FORMING A POTASSIUM ALUMINOBOROSILICATE FRIT

David Rostoker, Monroeville, Pa., assignor to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Filed May 10, 1976, Ser. No. 685,054

Int. Cl.² C03C 3/08

U.S. Cl. 106—54 **1 Claim**

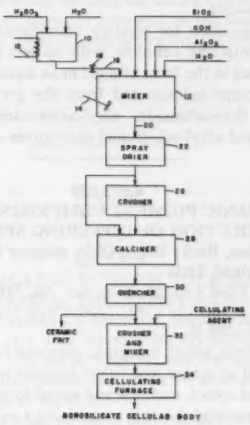
1. A method of forming a potassium aluminoborosilicate frit comprising,

forming an aqueous boric acid solution,

separately forming an aqueous slurry of potassium hydroxide, colloidal, high surface area, alpha monohydrate alumina particles, and amorphous, high surface area, colloidal, precipitated hydrated silica particles, said potassium hydroxide being added in a sufficient amount to provide a pH of about 10 for said aqueous slurry, and subjecting said slurry to high shear mixing,

mixing the boric acid solution with said aqueous slurry whereby said boric acid is absorbed on to the surface of the colloidal particles,

thereafter adding additional amorphous, high surface area, precipitated hydrated silica until said slurry contains about 22% by weight solids,



spray drying said slurry at a rate which enables forming substantially spherical agglomerates of the solid particles in said slurry and retaining the boric oxide on said particles,

calcining said agglomerates at a temperature sufficient to fuse said agglomerates,

rapidly quenching said fused agglomerates to prevent substantial divitrification of said fused agglomerates,

crushing said fused agglomerates to form a potassium aluminoborosilicate frit of a preselected size.

4,075,026
MORTARS AND CONCRETES CONTAINING PRETREATED AGGREGATE FILLERS

Edward H. Cumpston, Jr., 43 Monument Ave., Old Bennington, Vt. 05201

Filed Jan. 6, 1977, Ser. No. 757,231

Int. Cl.² C04B 7/02

U.S. Cl. 106—97 **43 Claims**

1. A concrete or mortar composition comprising a cement, an aggregate filler and water wherein at least a portion of said aggregate filler is pretreated prior to being added to the composition by sequential acidization and de-acidization.

4,075,027
CONSOLIDATION OF PARTICULATE MATERIALS

Kenneth George Knill, Ripley; Michael Kendal Bowler, Duffield, and Peter Hambleton, Belper, all of England, assignors to Charcon Products Limited, Hulland Ward, England

Filed Feb. 11, 1976, Ser. No. 657,188

Claims priority, application United Kingdom, Feb. 14, 1975, 6246/75

Int. Cl.² C04B 7/02

U.S. Cl. 106—99 **20 Claims**

5. A briquette comprising a consolidated mass consisting of a homogeneous mixture of metallic particles, at least 0.5% by weight of a fibrous material and at least 5.0% by weight of cement.

4,075,028

COMPOSITION FOR TREATING CELLULOSE-CONTAINING FIBROUS MATERIALS AND METHOD OF PRODUCING COMPOSITION FOR TREATING CELLULOSE-CONTAINING MATERIALS

Vladimir Alexandrovich Amosov, Nevsky prospekt, 96, kv. 122; Alexandr Evgenievich Guschin, Kovensky pereulok, 13, kv. 18; Jury Nikolaevich Efremov, Svetlanovsky prospekt, 99/2, kv. 42, and Rudolf Evgenievich Smirnov, ulitsa Tverskaya, 20, kv. 142, all of Leningrad, U.S.S.R.

Filed Apr. 22, 1976, Ser. No. 679,483
Int. Cl.[2] C08L *1/08;* C09J *3/04*
U.S. Cl. 106—186 8 Claims

1. A composition for treating cellulose-containing fibrous materials containing cellulose with no less than 13 wt.% of hemicelluloses in the form of a gel in an aqueous solution of at least one compound selected from the group consisting of carbamide, thiocarbamide, alkyl-substituted derivatives of carbamide, and alkyl-substituted derivatives of thiocarbamide.

4,075,029

INORGANIC PIGMENT COMPRISING A SOLID SOLUTION OF DIFFERING SPINELS

James W. Nuss, Rocky River, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Aug. 20, 1976, Ser. No. 716,343
Int. Cl.[2] C09C *1/00;* C01G *1/02*
U.S. Cl. 106—288 B 44 Claims

1. A multiple spinel inorganic pigment comprising a first spinel crystal structure and spinel-forming metal oxides of at least a second spinel, said first and spinel-forming oxides being combined as a solid solution comprising a cubic spinel crystal structure of said first spinel and containing dissolved witin said structure the spinel-forming metal oxides of said at least second spinel, said first spinel corresponding to one of the following formulas, and said spinel-forming metal oxides being present in proportions inter se to correspond to a different one of the following formulas:

$A^{+2}B_2^{+3}O_4$,
$A_2^{+2}B^{+4}O_4$,
$A^{+1}B_5^{+3}O_8$,
$A_4^{+1}B_5^{+4}O_{12}$, or
$A_2^{+1}B^{+2}C_3^{+4}O_8$,

in which A, B and C are ions of metals having a valence indicated by the associated exponents, and in which each of A, B and C of the spine-forming metal oxides has an ionic radius no greater than about 1.1 angstroms, said first spinel and said at least second spinel being present in all proportions forming a single phase solid solution.

4,075,030

HIGH BULKING CLAY PIGMENTS AND METHODS OF MAKING THE SAME

Wayne M. Bundy, Westfield; Joseph P. Berberich, Barnegat, and David Sastre, Elizabeth, all of N.J., assignors to Yara Engineering Corporation, Elizabeth, N.J.

Continuation-in-part of Ser. No. 591,851, June 30, 1975, abandoned. This application Aug. 1, 1977, Ser. No. 820,856
Int. Cl.[2] C04B *31/26*
U.S. Cl. 106—288 B 9 Claims

1. A method of producing a high bulking kaolinite of improved opacity comprising the steps of:

a. adding to a kaolinite slurry a selective flocculant for ultrafine particles and thereafter sufficient sulfuric acid in the presence of about 0.1% to about 0.7% fine mica below 150 mesh in size to recover from the kaolinite a flocculated ultrafine particle kaolinite fraction admixed with the mica, and

b. collecting and drying the selectively flocculated fine particle kaolinite and mica mixture as a dry pigment material.

4,075,031

TiO_2 PIGMENT COATED WITH DENSE SILICA AND POROUS ALUMINA/SILICA

Alvin Allen, Claymont, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 30, 1976, Ser. No. 728,413
The portion of the term of this patent subsequent to July 29, 1992, has been disclaimed.
Int. Cl.[2] C09C *1/36*
U.S. Cl. 106—300 10 Claims

1. Coated TiO_2 pigment consisting essentially of a core of pigmentary TiO_2, a dense inner coating of from 1% to 10% by weight of dense amorphous silica, calculated as SiO_2 and based on said pigmentary TiO_2, and from 0% to 5% by weight of alumina, calculated as Al_2O_3 and based on said pigmentary TiO_2, and a porous outer coating of porous silica and alumina, said porous silica being present in an amount from 0.5% to 15% by weight, calculated as SiO_2 and based on said pigmentary TiO_2, said alumina being present in an amount from 0% to 15% by weight, calculated as Al_2O_3 and based on said pigmentary TiO_2, wherein the total amount of alumina is at least 0.5% by weight, calculated as Al_2O_3 and based on said pigmentary TiO_2, wherein said dense amorphous silica and said porous silica and alumina substantially continuously coat said pigmentary TiO_2.

4,075,032

ANTIMONY OXIDE PIGMENT AND PROCESS OF MANUFACTURE

David Charles Thomas, Oklahoma City, Okla., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Apr. 18, 1977, Ser. No. 788,158
Int. Cl.[2] C09C *1/00*
U.S. Cl. 106—303 28 Claims

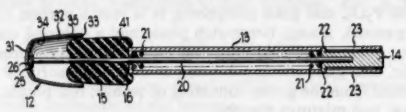
1. A coated antimony oxide pigment comprising:
an antimony oxide pigment;
a first coating comprising at least one member selected from the group of titania, predominately amorphous alumina or silica, on the antimony oxide pigment; and
a second coating comprising at least one member selected from the group of alumina, predominately boehmite alumina, or silica on the antimony oxide pigment over the first coating.

4,075,033

WIPING MATERIAL AND HOLDER

Michael A. Knox, 320 W. Normal Parkway, Chicago, Ill. 60621, and Mary Powers, P.O. Box 588, Cedar Falls, Iowa 50613

Filed Aug. 9, 1976, Ser. No. 712,653
Int. Cl.[2] A47K *10/16;* A61M *35/00;* B08B *1/00*
U.S. Cl. 134—6 11 Claims



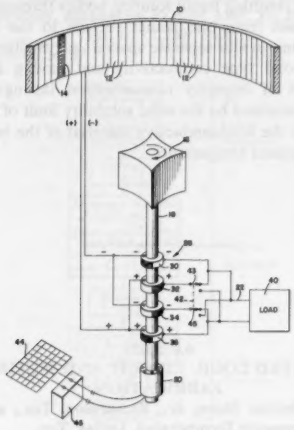
1. A method of treating a surface which comprises:
(A) placing in proximity to each other a cup-shaped web of at least two layers of substantially non-resilient flexible material and a grasping means connected to one end of an elongated handle means said grasping means having a resilient surface contacting said web;
(B) retaining with said grasping means said web at a fixed orientation relative to handle means;
(C) moving said handle means with said web retained by said grasping means so as to contact said surface with said web; and
(D) subsequent to the step of contacting said surface with said web, disengaging said web from said grasping means without manually touching the outside of said web.

4,075,034

SOLAR CONVERTER

David M. Butler, 46 Farragut Road, Annapolis, Md. 21403

Filed Feb. 8, 1977, Ser. No. 766,576
Int. Cl.[2] H01L *31/02*
U.S. Cl. 136—89 PC 12 Claims



1. A solar energy converter for producing variable amplitude energy waveforms directly from solar energy comprising

a solar bank having an array of photo-voltaic segments, each segment including a variable number of photo-voltaic cells and being adapted to produce a weighted voltage output proportional to the number of photo-voltaic cells when activated by solar energy;

means for reflecting concentrated solar light onto said solar bank;

means for scanning said reflecting means across said solar bank; and

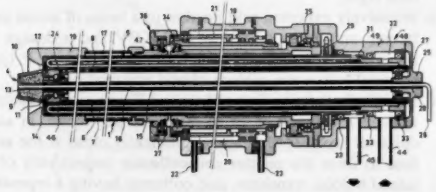
circuit means for connecting the output of said solar bank to a load.

4,075,035

TEMPERATURE DETECTING DEVICE FOR A FURNACE

Jean-Louis Trevedy, Metz, France, assignor to Institut de Recherches de la Siderurgie Francaise (IRSID), St. Germain-en-Laye-Cedex, France

Filed Dec. 24, 1975, Ser. No. 644,324
Claims priority, application France, Jan. 17, 1975, 75 01378
Int. Cl.[2] G01K *1/08;* H01V *1/30*
U.S. Cl. 136—210 7 Claims



1. A device for detecting the temperature in a furnace wherein heat rediation is produced, which comprises

a. a tubular casing having an axis and formed by a double wall concentrically surrounding the axis, the double wall defining an elongated chamber,

b. a longitudinal tubular element disposed in the chamber and dividing the chamber into two concentric compartments for the circulation of a cooling fluid therethrough,

c. a support tube disposed coaxially in the tubular casing and in contact with the double wall thereof,

d. a centering ring at one end of the support tube,

e. a thermally conductive, refractory tip disposed on the centering ring and projecting from the casing, the tip defining an axial bore,

f. a guide tube disposed within the support tube and extending along the casing, the guide tube being maintained by the centering ring in alignment with the bore of the tip and enabling a thermocouple with a heat sensitive element adjacent the tip to be introduced and received therein,

g. clearing means surrounding the casing and comprising an annular striker assembly mounted on the casing, and

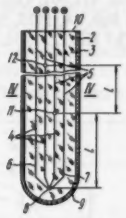
h. a mechanism for axially reciprocating the striker element.

4,075,036

PROFILED MULTIELECTRODE THERMOCOUPLE

Boris Vasilievich Lysikov, Universitetsky prospekt, 21, korpus 1, kv. 8; Jury Nikolaevich Shabanov, Sakhalinskaya ulitsa, 6, korpus 1, kv. 217; Jury Viktorovich Rybakov, ulitsa Gancharova, 7, kv. 58, all of Moscow, and Valentina Ivanovna Svetlova, stantsia Malakhovka, ulitsa Turgeneva, 43, Maskovskaya oblast, all of U.S.S.R.

Filed Sept. 10, 1975, Ser. No. 611,845
Claims priority, application U.S.S.R., Sept. 10, 1974, 2058145
Int. Cl.[2] H01V *1/00;* G01K *7/04*
U.S. Cl. 136—225 10 Claims

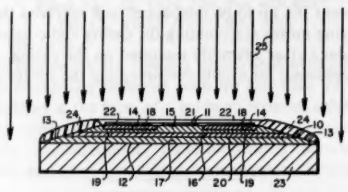


1. A profiled multielectrode thermocouple comprising a flexible protective shell having a free or probe end; first thermoelectrode means of one polarity constructed as a bundle of thermoelectrodes of different lengths and insulated from one another, the longest thermoelectrode of said one polarity extending through said shell to a remote point proximate to said probe end, and the other thermoelectrodes of said one polarity having shorter lengths and connected to said longest thermoelectrode at said remote point and extending from said remote point to different intermediate points along the length of said shell; and second thermoelectrode means comprising at least two thermoelectrodes of different lengths and of opposite polarity arranged in said shell each of which is connected to another one of said thermoelectrodes of said one polarity, said longest thermoelectrode of said one polarity being connected to the longest thermoelectrode of said other polarity at said remote point to form a first working junction, each connection of an associated pair of thermoelectrodes of opposite polarities at an intermediate point forming an intermediate working junction, said working junctions at said remote and intermediate points being spaced from each other at substantially uniform distances along the length of said protective shell.

4,075,037
TAILORING OF RECOVERY CHARGE IN POWER DIODES AND THYRISTORS BY IRRADIATION

Krishan S. Tarneja; Joseph E. Johnson, and John Bartko, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 17, 1976, Ser. No. 687,278
Int. Cl.[2] H01L *21/263*
U.S. Cl. 148—1.5 10 Claims



1. A method of tailoring the recovery charge of a device of a type of diode or thyristor comprising the steps of:

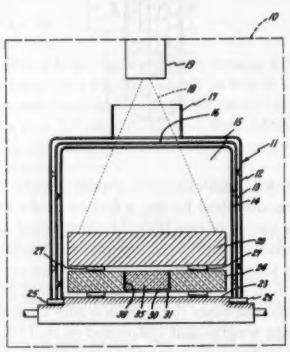
A. positioning a junction diode or thyristor semiconductor body with a major surface thereof to be exposed to a radiation source;

B. thereafter irradiating said semiconductor body with the radiation source to a dosage between about 1×10^{12} and 8×10^{12} electrons/cm^2 to reduce the recovery charge of the device.

4,075,038
DEEP DIODE DEVICES AND METHOD AND APPARATUS

Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 411,001, Oct. 30, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,154
Int. Cl.[2] H01L *29/04, 7/00*
U.S. Cl. 148—1.5 6 Claims

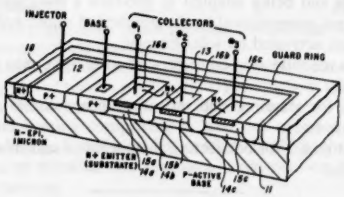


1. The method of making a semiconductor device comprising a body of semiconductive material having a first type conductivity in the form of a wafer having substantially planar top and bottom surfaces and a plurality of separate spaced recrystallized regions of semiconductive material having a second type conductivity extending in straight lines from the top surface to the bottom surface of the body, which comprises the steps of providing in contact with one of said surfaces of the body a plurality of separate deposits of a solid metallic material with which the semiconductive material of the body will form a solution of melting point temperature below that of the semiconductive material of the body, heating the solid metallic material to a predetermined elevated temperature and forming a liquid solution of the semiconductive material of the body at each of the deposit sites, establishing and maintaining a selected finite temperature gradient in a direction normal to the said top and bottom surfaces through the body, and coextensively in time establishing and maintaining a zero temperature gradient through the body in a direction normal to the direction of the said selected finite temperature gradient, and migrating the resulting liquid solution bodies through the body in straight lines from one planar surface to the other and thereby forming in situ separate spaced recrystallized regions having a second type conductivity and having a constant uniform level of impurity concentration throughout their lengths as determined by the solid solubility limit of the metallic material in the semiconductive material of the body at the said predetermined temperature.

4,075,039
INTEGRATED LOGIC CIRCUIT AND METHOD OF FABRICATION

Benjamin Johnston Sloan, Jr., Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 588,255, June 19, 1975. This application Aug. 30, 1976, Ser. No. 719,024
Int. Cl.[2] H01L *21/26*
U.S. Cl. 148—1.5 4 Claims



1. A method for the fabrication of an integrated semiconductor injection logic device comprising the steps of:

a. forming a monocrystalline epitaxial layer of N type conductivity and a thickness of about 1–2 microns having a resistivity of about 0.3–2 ohm centimeter on an N type monocrystalline silicon substrate having a resistivity of 0.005–0.05 ohm centimeter;

b. forming on said surface layer an N type guard ring of low resistivity completely surrounding a portion of said surface layer;

c. selectively exposing said portion to a beam of boron ions having an energy of 400 to 600 KEV and a dosage of about 10^{13} ions/cm^2 thereby forming a band of P type material below the surface of said epitaxial layer;

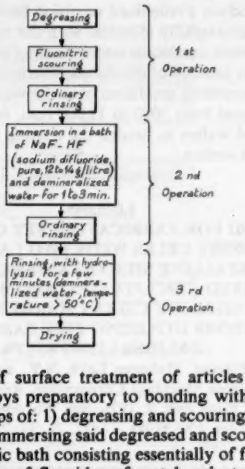
d. selectively forming first and second P type regions having a sheet resistance of 25 to 50 ohms per square in said epitaxial layer, spaced apart sufficiently close at the surface to form the emitter and collector respectively of a lateral bipolar transistor, said collector having a repeated pattern of segments which extend through the thickness of said epitaxial layer to define and separate a plurality of epitaxial regions, including a like plurality of segments of said previously implanted P type band below the surface of said epitaxial layer; and

e. forming ohmic contacts to said emitter and collector respectively of said lateral bipolar transistor and forming ohmic contacts to each of the repeated segments defined by said collector to complete the device.

4,075,040
TITANIUM AND TITANIUM ALLOY SURFACE PREPARATION METHOD FOR SUBSEQUENT BONDING

Roland Villain, Feucherolles, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed July 15, 1976, Ser. No. 705,480
Claims priority, application France, Mar. 15, 1976, 76 07375
Int. Cl.[2] C23F 7/06
U.S. Cl. 148—6.14 R **14 Claims**

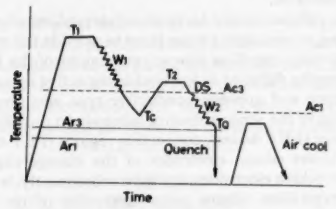

Degreasing
Fluonitric scouring
Ordinary rinsing
1 st Operation
Immersion in a bath of NaF - HF (sodium difluoride, pure, 12 to 14 g/litre) and demineralized water for 1 to 3 min.
Ordinary rinsing
2 nd Operation
Rinsing with hydrolysis for a few minutes (demineralized water, temperature > 50°C)
3 rd Operation
Drying

1. A method of surface treatment of articles containing titanium or its alloys preparatory to bonding with adhesives, comprising the steps of: 1) degreasing and scouring the surface of said articles; 2) immersing said degreased and scoured article in an aqueous acidic bath consisting essentially of from 0.16 to 0.23 mole per liter of fluorides of metals selected from the group consisting of the alkali metals and the alkaline earth metals; and 3) hydrolysing of the resulting surface coating in demineralized water at a temperature of at least 50° C. for a time sufficient to obtain a layer of substantially pure anatase containing superficial OH sites for said adhesive.

4,075,041
COMBINED MECHANICAL AND THERMAL PROCESSING METHOD FOR PRODUCTION OF SEAMLESS STEEL PIPE

Masakatsu Ueno; Osamu Kato, both of Kitakyushu; Nobuyuki Kawauchi, Shiki, and Kametaro Itoh, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Oct. 20, 1976, Ser. No. 734,369
Claims priority, application Japan, June 14, 1976, 51-69613
Int. Cl.[2] C21D 9/08
U.S. Cl. 148—12.4 **7 Claims**



1. A process for producing a seamless steel pipe comprising the steps of:

a. primary hot working a bloom into a mother tube with an intermediate cross-section comparatively nearer to that of the finished pipe product;

b. removing scale from the outside surface of said mother tube while being entirely austenitized;

c. secondary hot working said mother tube into a pipe of final dimensions with a degree of work applied thereto, measured in terms of equivalent strain ($\bar{\epsilon}$) as expressed by the following formula, of not less than $\bar{\epsilon} = 0.02$,

$$\bar{\epsilon} = \sqrt{2/3}\sqrt{(\epsilon_1 - \epsilon_2)^2 + (\epsilon_2 - \epsilon_3)^2 + (\epsilon_3 - \epsilon_1)^2}$$

wherein

$\epsilon_1 = ln(l_2/l_1)$

$\epsilon_2 = ln(t_2/t_1)$

$\epsilon_3 = ln[(2r_2 - t_2)/(2r_1 - t_1)]$

in which l_1, t_1 and r_1 are the length, thickness and radius of the mother tube respectively, and l_2, t_2 and r_2 are the length, thickness and radius of the pipe of final dimensions respectively; and

d. directly quenching said pipe of final dimensions.

4,075,042
SAMARIUM-COBALT MAGNET WITH GRAIN GROWTH INHIBITED $SmCo_5$ CRYSTALS

Dilip K. Das, Bedford, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 416,700, Nov. 16, 1973, abandoned, which is a continuation of Ser. No. 131,777, April 6, 1971, abandoned, which is a continuation-in-part of Ser. No. 778,041, Nov. 22, 1968, abandoned. This application May 9, 1977, Ser. No. 794,879
Int. Cl.[2] H01F 1/02
U.S. Cl. 148—103 **10 Claims**

1. A rare earth-cobalt magnet of a rare earth designated by the symbol R comprising a shaped sintered structure of fine particles of rare earth and cobalt corresponding to the mixture of RCo_5 and R_2Co_7, said structure having an energy product greater than the actual energy product of RCo_5 or R_2Co_7, each taken alone, wherein R is a rare earth selected from the group consisting of samarium, cerium, praesodymium and lanthanum, and consisting essentially of grains of RCo_5 of single domain size and at least partially surrounded by crystallized R_2Co_7.

4,075,043
LIQUID PHASE EPITAXY METHOD OF GROWING A JUNCTION BETWEEN TWO SEMICONDUCTIVE MATERIALS UTILIZING AN INTERRUPTED GROWTH TECHNIQUE

John Elwood Clarke; Austin M. Andrews, II; Edward R. Gertner, all of Newbury Park; Joseph T. Longo, and John G. Pasko, both of Thousand Oaks, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 1, 1976, Ser. No. 719,559
Int. Cl.[2] H01L 21/368, 21/76
U.S. Cl. 148—171 **5 Claims**

1. A method of obtaining a heterojunction comprising the following continuous series of steps:

providing a substrate of $(Pb_{1-x}Sn_x)Te$;

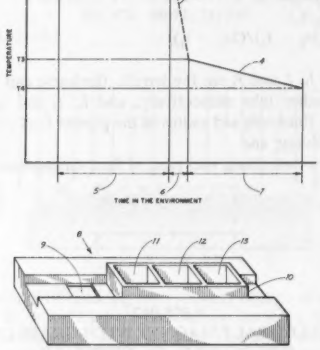
placing a first growth environment comprising a melt of Pb, Sn, and Te in contact with said substrate;

growing in situ by liquid phase epitaxy technique a first layer comprising $(Pb_{1-x}Sn_x)Te$ on said substrate from a first temperature to a lower second temperature;

removing said first environment to discontinue said growing of a first layer

changing said second temperature to a lower third temperature;

placing a second growth environment comprising a melt of Pb and Te in contact with said first layer; and



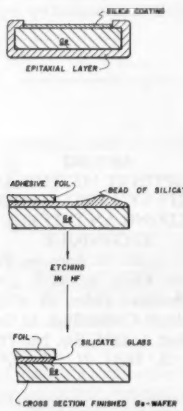
growing in situ by liquid phase epitaxy technique a second layer comprising PbTe on said first layer from said third temperature to a lower fourth temperature.

4,075,044

METHOD OF PRODUCING A SILICEOUS COVER LAYER ON A SEMICONDUCTOR ELEMENT BY CENTRIFUGAL COATING UTILIZING A MIXTURE OF SILICA EMULSIONS

Hans Jüger, Bad Homburg, and Emil Seipp, Eschborn, both of Germany, assignors to S.A. Metallurgie Hoboken-Overpelt N.V., Belgium

Filed Feb. 11, 1976, Ser. No. 657,317
Claims priority, application Germany, Feb. 15, 1975, 2506457
Int. Cl.[2] H01L *21/20, 21/31, 21/316*
U.S. Cl. 148—175 **7 Claims**



1. A method of coating a semiconductor wafer with a siliceous cover layer having a peripheral bead formation substantially free from cracking at elevated temperatures wherein the temperature coefficient of said cover layer is approximately equal to the temperature coefficient of the semiconductor wafer, which comprises forming a combined emulsion by mixing together a first emulsion of a non-doped, pure silica emulsion and a second emulsion of a heavily-doped silica emulsion coating a test wafer with said combined emulsion, distributing the combined emulsion so-formed over the wafer by centrifugal force at a speed from 3000 to 11,00 rpm, controlling the thickness of the peripheral bead between about 0.5 to 1 μm, and the thickness of the rest of the cover layer between about 0.15 to 0.3 μm, hardening the resultant layer for at least 10 minutes at a temperature of about 300° C, thereafter subjecting the hardened cover layer to thermal treatment at temperatures in excess of 300° C, at which the so-treated layer is to be employed later and then examining said layer microscopically for crack formation in the area of the peripheral bead and selecting the optimum mixture of said first and second emulsions, thereby adjusting the ratio of the first and second emulsions that they produce a combined emulsion having a temperature coefficient substantially identical with the temperature coefficient of the semi-conductor wafer, coating device wafers with said optimum mixture of emulsions, distributing said optimum mixture of combined emulsions over the wafers by centrifugal force at a speed from 3000 to 11,000 rpm. and drying heating the so-coated wafers to harden the coating of siliceous cover layer on said wafers.

4,075,045

METHOD FOR FABRICATING FET ONE-DEVICE MEMORY CELLS WITH TWO LAYERS OF POLYCRYSTALLINE SILICON AND FABRICATION OF INTEGRATED CIRCUITS CONTAINING ARRAYS OF THE MEMORY CELLS CHARGE STORAGE CAPACITORS UTILIZING FIVE BASIC PATTERN DELIBERATING STEPS

Vincent L. Rideout, Mohegan Lake, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 9, 1976, Ser. No. 656,756
Int. Cl.[2] H01L *21/22, 21/31, 29/78*
U.S. Cl. 148—187 **25 Claims**

1. A method for fabricating an integrated circuit array of FET one-device memory cells having oxide isolation between cells, and each cell of the array having a doped bit line; polysilicon-gate FET self-aligned to source and drain regions; a metallic-type high-electrically conductive word line; a self-registering connection between the gate and the word line; and a charge storge capacitor with a polysilicon upper electrode and a doped silicon lower electrode beneath the polysilicon upper electrode, the lower electrode being doped opposite in conductivity type to the substrate doping, which comprises:

(A) providing a semiconductive substrate of a first conductive type containing active impurities of a first conductive type;

(B) providing and delineating predetermined oxide isolation regions above or recessed into the substrate to provide insulating field oxide regions between memory cells of the array;

(C) providing an insulator for the FET gates;

(D) depositing a layer of polycrystalline silicon above the gate insulator;

(E) then delineating the layer of polycrystalline silicon employing an oxidation barrier layer to provide the predetermined polycrystalline silicon gate regions of the FETs;

(F) thermally diffusing or ion implanting active impurities of a second and opposite conductive type into preselected regions of the semiconductive substrate to provide doped bit lines (FET drains); connection regions (FET sources); and lower silicon electrodes of the storage capacitors, above which electrodes, are to be subsequently delineated polycrystalline silicon upper electrodes of the storage capacitors;

(G) providing an insulator for the storage capacitors;

(H) then depositing a second and subsequent layer of polycrystalline silicon above the insulator for the storage capacitors;

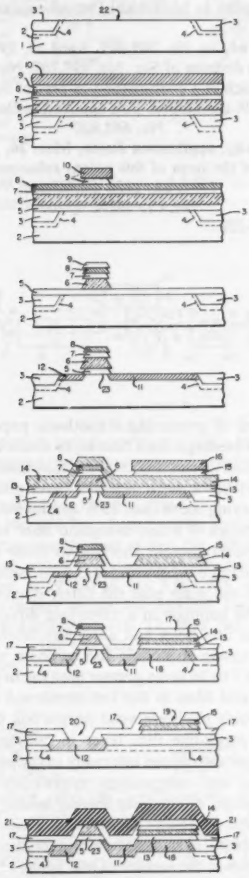
(I) then delineating the second and subsequent layer of doped polycrystalline silicon to provide predetermined upper electrode regions above the corresponding doped lower silicon electrodes or the storage capacitors;

(J) thermally growing a silicon dioxide insulating layer over

regions of the structure but not over the polycrystalline silicon FET gates which are still protected by an oxidation barrier layer;

(K) removing the oxidation barrier layer from over the FET gates by use of an etchant;

(L) delineating contact holes to polycrystalline silicon upper capacitor electrodes; and to doped sources and drains in circuits peripheral to the array of memory cells;



(M) depositing and delineating a metallic-type high-conductivity electrical interconnection pattern that makes electrical connection to the polycrystalline silicon FET gates in the array of memory cells; to polycrystalline silicon upper capacitor electrodes; and to FET gates, sources, and drains in circuits peripheral to the array of memory cells.

4,075,046

TIPPED LACE

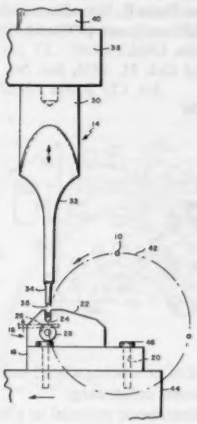
Harold B. MacDonald, Hudson, Mass., assignor to Thomas Taylor & Sons, Inc., Hudson, Mass.

Filed Oct. 12, 1976, Ser. No. 731,778

Int. Cl.[2] B32B *31/20*

U.S. Cl. 156—73.1 **6 Claims**

1. A method of rigidifying a portion of a flexible length of fibrous material embodying a material which may be made rigid and hard by pressure and heating comprising subjecting the portion to be made rigid while confined within a die of predetermined cross section desirably to be imparted to the portion to be rigidified to sonic vibrations in a plane diametral to the axis of the portion and simultaneously to reciprocation in



a plane at right angles to said diametral plane to cause the constituent fibers to soften and become bonded to each other.

4,075,047

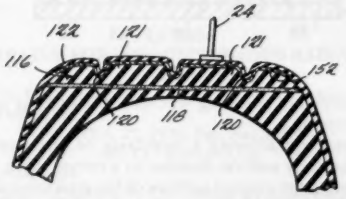
TIRE RETREADING SYSTEM

Edwin T. Brodie, and Donaldee Brewer, both of Muscatine, Iowa, assignors to Bandag Incorporated, Muscatine, Iowa

Filed Oct. 14, 1975, Ser. No. 622,419

Int. Cl.[2] B29H *17/36, 17/37*

U.S. Cl. 156—96 **12 Claims**



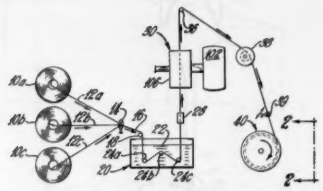
1. In a method of bonding a precured profiled tread strip to a tire casing by means of a self-vulcanizing bonding material interposed between the tire and the tread strip, said method comprising applying a flexible impermeable cover over the tread strip and tire assembly to form a sealed space between the cover and the assembly, exhausting air from the space and pressing the cover against the tread strip, the improvement comprising interposing between the tread strip and the cover a thin flexible perforated film of synthetic polymeric non-stick stretchable material having lubricating properties, said film thereby facilitating sliding of the flexible cover against the surface of the tread strip so as to aid in exhausting air from the space between the cover and the assembly.

4,075,048

METHOD FOR PRODUCING A BEAD FOR A PNEUMATIC TIRE

Daniel C. Lupton; Donn R. Vermilion, and James L. Bucher, all of Newark, Ohio assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 31, 1975, Ser. No. 627,802
Int. Cl.[2] B29H *17/32*
U.S. Cl. 156—136 6 Claims



1. The method of producing a bead member for a pneumatic tire having a carcass comprising:

applying an elastomeric material to a bundle of filaments to form a coated bundle;

drying the elastomeric material;

winding the coated bundle upon a heated mandrel to form a toroidally shaped bead member, the mandrel being heated sufficient to initiate curing of the elastomeric material; and

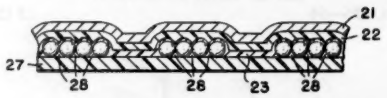
before incorporating the bead member in the tire, heating the bead member to further cure the elastomeric material so that the bead member retains the same geometric characteristics during incorporation into the tire as the bead member possessed before incorporation into the tire.

4,075,049

METHOD OF PREPARING RETROREFLECTIVE SHEETING

William A. Wood, Newtown, Pa., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 1, 1976, Ser. No. 719,647
Int. Cl.[2] B44C *1/00;* B32B *31/20;* B31F *1/00*
U.S. Cl. 156—220 9 Claims



1. A method of preparing retroreflective sheeting comprising the steps of:

a. temporarily adhering a monolayer of glass spheres of substantially uniform diameter to a release sheet;

b. covering the exposed surfaces of the glass spheres with a light reflecting material to form a light reflecting layer on said monolayer of glass spheres;

c. imparting a grid pattern to the monolayer of glass spheres on the light reflecting layer thereof such that the depth of the grid pattern is at least the radius of the glass spheres remaining in said monolayer;

d. applying a sphere binder layer over said grid pattern imposed on the monolayer of glass spheres, said sphere binder layer having sufficient plastic flow to adhere to the light reflecting layer on said monolayer of spheres but not to the opposing surfaces of said spheres;

e. removing said release sheet to leave a distributed sphere covered sheet; and

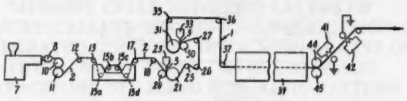
f. pressure consolidating said distributed sphere covered sheet against a clear, protective overlay film, said overlay film bonding to said sphere binder layer in the grooves defined by the grid pattern.

4,075,050

METHOD OF MAKING SYNTHETIC PAPER

Masanori Takashi, Ami, and Mitsuo Yoshiyasu, Ibaraki, both of Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Continuation of Ser. No. 349,961, April 11, 1973, abandoned, which is a division of Ser. No. 197,757, Nov. 11, 1971, abandoned, which is a continuation-in-part of Ser. No. 809,629, March 21, 1969, abandoned. This application Dec. 17, 1975, Ser. No. 641,820
Claims priority, application Japan, Mar. 26, 1968, 43-19204
The portion of the term of this patent subsequent to Mar. 26, 1991, has been disclaimed.
Int. Cl.[2] B29C *17/02*
U.S. Cl. 156—229 4 Claims



1. A method of producing a synthetic paper-like laminate comprising, providing a base film layer made of a thermoplastic resin, uniaxially orienting the base film layer, laminating on said base film layer a paper-like film layer made of a thermoplastic resin having more than 25% and no more than 65% by weight of particles of a fine inorganic filler substantially uniformly distributed therein thereby to form a laminate, the weight percentage of said inorganic filler being dependent on the weight of the resin plus the filler, stretching while in a heated state the laminate in a transverse direction to biaxially orient the base film layer and uniaxially orient the paper-like film layer including stretching the laminate in the transverse direction from 7 to 16 times greater than the original transverse dimension of said films in the last-mentioned direction to develop microvoids having a void proportion of from 10% to 65% in said paper-like film layer in conjunction with said particles of filler distributed internally in the paper-like layer as communicating and independent microvoids to develop fibrous-like portions of the resin thereof among the microvoids interiorly of said paper-like film layer to define therein a cellular, fibrous structure, said stretching including developing of microvoids open to the surface of said paper-like film layer free of said base film layer and distributed throughout said surface, ceasing said stretching, and setting said resin after stretching maintaining the internal microvoids including the last-mentioned microvoids open to said surface upon cessation of said stretching.

4,075,051

METHOD OF TRIMMING PHOTORESIST FILM

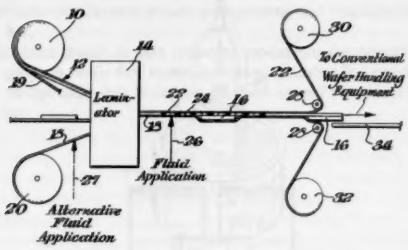
Paul Charles Brzozowski, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 29, 1976, Ser. No. 745,682
Int. Cl.[2] G03C *1/90*
U.S. Cl. 156—236 6 Claims

1. In a method of applying a photoresist film supported by a coversheet to a substrate by laminating one side of said film to said substrate and trimming said film along the edges of said substrate, the improvement of:

applying a film weakening agent to those portions of the

substrate side of said film that are unprotected by said substrate, and



separating said coversheet from said film in the region of said substrate in either order.

4,075,052

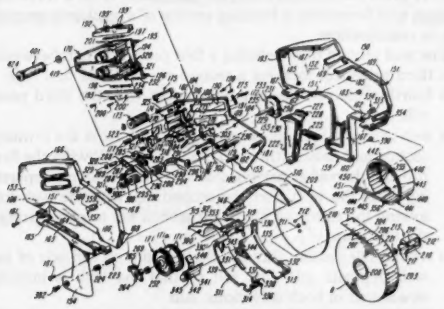
APPARATUS FOR PRINTING AND APPLYING PRESSURE SENSITIVE LABELS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 476,744, June 5, 1974, Pat. No. 3,957,562, which is a continuation-in-part of Ser. No. 380,445, July 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 312,454, Dec. 6, 1972, Pat. No. 3,968,745, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Feb. 17, 1976, Ser. No. 658,431

Int. Cl.[2] B32B *31/00*

U.S. Cl. 156—384 **25 Claims**



1. Apparatus for printing on a web of record members, comprising: a platen, a print head cooperable with the platen to print the web of record members, the print head having a gear section, a gear in meshing contact with the gear section, a feed wheel having a plurality of teeth at its outer periphery and rotatable in one direction for advancing the web, a ratchet wheel drivingly coupled to the feed wheel, means for adjusting the postion of the feed wheel relative to the ratchet wheel, a rolling-contact type one-way clutch for mounting the feed wheel and for preventing rotation of the feed wheel in the opposite direction, and a pawl driven by the gear for advancing the web into printing cooperation with the print head and the platen.

4,075,053

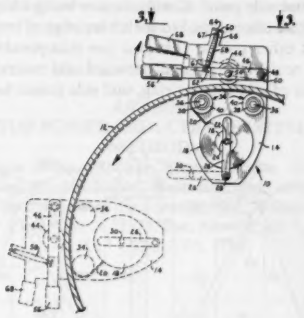
MASKING TAPE APPLICATOR FOR PIPE

Franklin Montague Adams, Forest Hill, Australia, assignor to Price International, Inc., Sharjan, United Arab Emirates

Filed June 25, 1976, Ser. No. 699,626

Int. Cl.[2] B65H *81/00*

U.S. Cl. 156—391 **1 Claim**



1. A device for applying tape to the inside surface of a pipe, said device comprising:

a frame;

a pair of tape applicator rollers rotatably mounted on said frame at spaced apart locations theron and adapted to roll in a generally circumferential direction along the inside pipe surface in a manner to press a strip of tape thereagainst;

tape support means on said frame for supporting a roll of tape and dispensing tape from the roll in a strip, said tape support means being located approximately on an imaginary perpendicular bisector of a straight line extending between said applicator rollers and being disposed within the pipe when said applicator rollers are applied to the inside surface thereof;

a guide roller rotatably mounted on said frame and adapted to roll along the outside pipe surface in opposition to said applicator and guide rollers; and

resilient means for urging said applicator and quide rollers generally toward one another to maintain the rollers in rolling contact with the pipe as said frame moves around same.

4,075,054

APPARATUS FOR FORMING BEADED RADIAL PLY TIRE

Charles C. Sons, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 27, 1976, Ser. No. 735,924

Int. Cl.[2] B29H *17/06*

U.S. Cl. 156—414 **7 Claims**

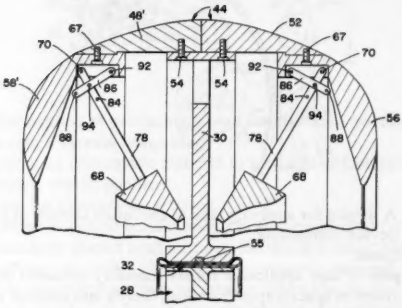
1. A disassemblable core for forming a beaded radial ply tire having an annular tread region, and plies which extend about bead regions of the tire and include first end portions that are doubled back at the bead regions and terminate at inner portions of side walls of the tire, comprising:

a. a plurality of arcuate beams positioned together edge-to-edge to form a circular support ring having a central axis;

b. a plurality of mold pieces supported on said circular support ring and positioned together edge-to-edge to form an inner mold for the annular tread region of the tire, one of said mold pieces being a key piece and another of said mold pieces being adjacent said one mold piece; said one mold piece having an edge angled to match an edge of said other mold piece so that said one mold piece is removable towards said central axis in the absence of said support ring;

c. first means for releasably securing said mold pieces to said arcuate beams;

d. a first plurality and a second plurality of pairs of side panels, said side panels of, respectively, said first plurality and said second plurality of pairs being positioned together edge-to-edge to form an inner mold face for one of the side walls of the tire, said side panels of one of said pairs being adjacent said side panels of another of said pairs, one side panel of said one pair being a key panel and having an edge angled to match an edge of one side panel of said other pair so that said one side panel of said one pair is removable generally toward said central axis in the absence of said support ring, said side panels being shaped



to receive folded back second end portions of a tire line during formation of the tire;

e. second means for releasably securing said first and said second plurality of side panels to said mold pieces; and

f. a plurality of means, each pivotally attached to one of said side panels, for providing the bead regions with the plies, said bead region providing means having means extending from said side panels and pivotable to a first position to form a mold for receiving bead wedge portions and pivotable away from the bead wedge portions to a second position so that said first end portions of said plies can be doubled back over the bead wedge portions and said second end portions of the liner can be folded over the first end portions of the plies.

4,075,055

METHOD AND APPARATUS FOR FORMING AN ELONGATED SILICON CRYSTALLINE BODY USING A <110>{211}ORIENTATED SEED CRYSTAL

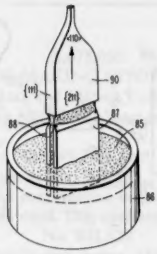
Theodore Frank Ciszek, Salt Point, and Guenter Herbert Schwuttke, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 16, 1976, Ser. No. 677,580
Int. Cl.[2] B01J *17/18;* C01B *33/02*
U.S. Cl. 156—608 **4 Claims**

1. Method for growing an elongated silicon crystalline body comprising:

establishing a molten film of silicon overlying the top surface of a carbon containing capillary die;

growing and pulling said body from the film by using a <110> direction, {211} face plane, {111} edge plane, oriented silicon seed crystal whereby said pulling being in the <110> direction with {211} face plane and {111} edge plane which results in twinning along the <110> direction perpendicular to the {211} face plane, and parallel to the {111} edge plane of said body and which allows



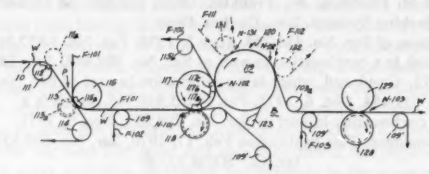
any carbon impurities to be incorporated into said body so as to prevent significant nucleation of additional defects.

4,075,056

PRESS SECTION STRUCTURE

Donald E. Ely, Roscoe, Ill., and Arnold J. Schmitt, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 497,722, Aug. 15, 1974, abandoned, which is a continuation of Ser. No. 407,574, Oct. 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 115,235, Feb. 16, 1971, abandoned. This application Mar. 8, 1977, Ser. No. 775,572
Int. Cl.[2] D21F *3/04, 3/08*
U.S. Cl. 162—305 **6 Claims**



1. A press mechanism for removing water from a traveling fibrous web formed on a forming section of a machine comprising in combination:

first and second rolls defining a first press nip therebetween;

a third press roll forming a second nip with the first roll;

a fourth press roll forming a third nip with the third press roll;

a web carrying first felt receiving the web from the forming section and passing through the first nip following the first roll and thereafter passing through the second nip separating from the web after the second nip with the web following the third roll after said second nip to pass through the third nip;

a second felt passing through the first nip on the side of the web opposite said first felt so that the web is initially dewatered in both directions; and

a third felt passing through said third nip with the web, said web passing sequentially through said first, second, and third nips being supported continually between nips.

4,075,057

NON-EQUILIBRIUM RADIATION NUCLEAR REACTOR

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of Karlheinz Thom, Gaithersburg, Md., and Richard T. Schneider, Gainesville, Fla.

Filed Mar. 21, 1975, Ser. No. 560,891
Int. Cl.[2] G21C *1/22*
U.S. Cl. 176—39 **18 Claims**

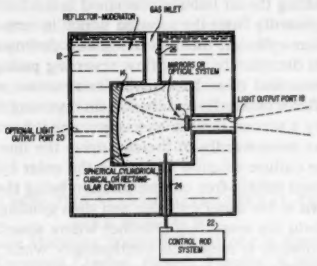
1. A gaseous core nuclear reactor operating at wide ranges

of temperature and pressure generating output power primarily in the form of non-equilibrium electromagnetic energy, comprising:

a centrally located reaction chamber,

reflector-moderator means surrounding said reaction chamber,

fuel inlet means in said reflector-moderator for admitting a gaseous fissile fuel to said reaction chamber for providing an optically thin fissioning medium in said reaction chamber,



control means cooperating with said reaction chamber for controlling the reaction rate therein;

power output means mounted in said reflector-moderator for permitting said non-equilibrium electromagnetic energy to be transmitted from said reaction chamber to the exterior of said reactor, said power output means comprising at least one optically transparent window; and

means for maintaining the temperature of such reaction chamber between 100° and 3000° F.

4,075,058

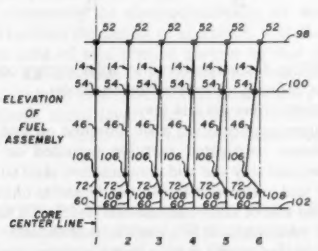
ARTICULATED FUEL ASSEMBLY

Richard Croissant Noyes, Hartford, China /Taiwan, assignor to Combustion Engineering, Inc., Windsor, Conn.

Division of Ser. No. 296,737, Oct. 11, 1972, abandoned. This application Mar. 8, 1976, Ser. No. 665,018

Int. Cl.² G21C *7/30*

U.S. Cl. 176—21 **4 Claims**



1. A nuclear reactor comprising:

(a) a reactor vessel having a nuclear core therewithin;

(b) a plurality of fuel assemblies for said nuclear core each of which includes:

1. a plurality of longitudinally extending fuel elements; and

2. an elongated hollow housing surrounding said plurality of fuel elements;

(c) means for supporting said fuel assembly in said nuclear core, said means being restrained against movement and axially spaced from the lower end of said fuel assembly housings;

(d) clamping means for clamping the upper ends of said fuel assembly housings in said nuclear core to restrain the upper ends of said housings against lateral movement; and

(e) means for inserting negative reactivity comprising a double articulating connector for each of said fuel assemblies for connecting the lower end of said fuel assembly housings to said support means, each of said double articulating connectors permitting articulating movement at both its upper and lower ends so as to allow lateral movement of the lower end of said housing relative to said restrained upper end of said housing and said restrained support means.

4,075,059

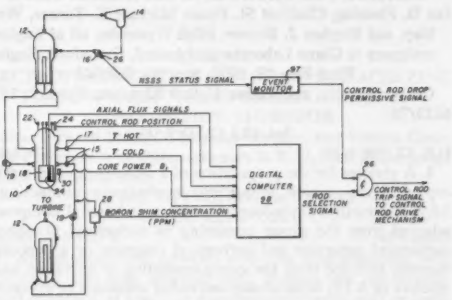
REACTOR POWER REDUCTION SYSTEM AND METHOD

Stephen James Bruno, Medway, Mass.; Stephen Alfred Dunn, Enfield, and Marvin Raber, West Hartford, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 28, 1976, Ser. No. 681,101

Int. Cl.² G21C *7/06, 7/00*

U.S. Cl. 176—22 **11 Claims**



1. An improved control method for maintaining the operation of a nuclear reactor system in response to an event which requires an immediate but less than complete power reduction called an accelerated power reduction, said reactor being of the type which has a reactor core cooled by a coolant circulated therethrough and control rods for movement into said core and said reactor further being of the type which is normally controlled by the insertion and withdrawal of a series of regulating rods into and out of said reactor core following a predetermined regulation sequence, wherein said improved method including the step of rapidly decreasing reactor power without causing the product of the radial peaking factor of said reactor core and the power of said reactor core to increase on the occurrence of an event which require an accelerated power reduction by rapidly inserting into said reactor core a portion of said regulating rods selected from said predetermined regulation sequence.

4,075,060

METHOD FOR REMOVING FISSION PRODUCTS FROM A NUCLEAR REACTOR COOLANT

Richard P. Colburn, Youngwood, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

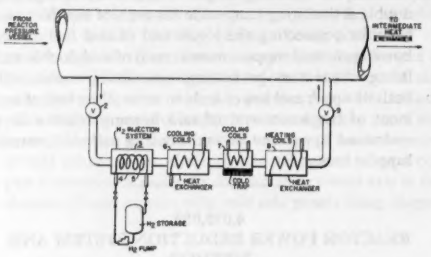
Continuation of Ser. No. 261,476, June 9, 1972, now Defensive Publication No. T921,014. This application July 31, 1974, Ser. No. 493,368

Int. Cl.² G21C *19/32;* G21F *9/04*

U.S. Cl. 176—37 **14 Claims**

1. A method for removing fission products from a liquid metal reactor coolant of a nuclear reactor, said method comprising the steps of diverting a portion of said reactor coolant from a main stream of said nuclear reactor to a bypass system, adding hydrogen to said bypassed reactor coolant, then lower-

ing the temperature of said bypassed reactor coolant, precipitating said fission products from said bypassed reactor coolant



and reintroducing said bypassed reactor coolant into said main stream without the precipitates.

4,075,061

METHOD FOR PRODUCING CEPHALOSPORINS

Ian D. Fleming, Chalfont St. Peter; Michael K. Turner, Wembley, and Stephen J. Brewer, High Wycombe, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Filed Feb. 15, 1977, Ser. No. 768,945

Claims priority, application United Kingdom, Feb. 19, 1976, 6623/76

Int. Cl.[2] C12D *9/00*

U.S. Cl. 195—29 **12 Claims**

1. A process for the preparation of a 3-carbamoyloxymethyl cephalosporin which comprises incubatively contacting a 3-hydroxymethyl cephalosporin with a carbamoyl compound selected from the group consisting of carbamoyl phosphate, carbamoyl aspartate and carbamoyl oxamate or a precursor therefor selected from the group consisting of citrulline, and a mixture of ATP, bicarbonate and either ammonia or glutamine in the presence of an enzyme showing the desired O-transcarbamoylase activity derived from a microbial source.

4,075,062

THROW-IN TYPE COLORIMETER

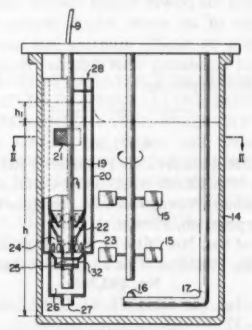
Takehiko Shibata, Wako; Tadahiko Ando, Tokyo; Tokuji Kitsunai, Asaka; Norio Kamiyama, Kawagoe, and Yoshifumi Oikawa, Asaka, all of Japan, assignors to Rikagaku Kenkyusho, Japan

Filed June 8, 1976, Ser. No. 693,758

Claims priority, application Japan, June 11, 1975, 50-70387

Int. Cl.[2] C12K *1/00*; G01N *21/26*

U.S. Cl. 195—103.5 R **6 Claims**



4. A method of cultivation in which a thrown-in type colorimeter is provided in an aerobic fermentation culture tank and the optical density of the culture solution is measured in a measuring chamber so as to carry out cultivation while constantly observing the degree of growth of the microbes in said tank, which comprises the steps of introducing said culture solution into a defoaming device located in said culture tank, said defoaming device comprising a two-cylinder structure consisting of an inner cylinder and an outer cylinder, both opened at the top, said structure having a solution inlet opening into the inner cylinder and positioned in opposition to the solution flow in said culture tank, allowing the culture solution to flow into the inner cylinder by virtue of the liquid level difference obtained from the rise of the liquid level caused by impingement of the solution flow in the tank against the colorimeter, letting the air bubbles contained in the culture solution escape upwardly from the solution which in turn flows down in the inner cylinder, then reversing said downward solution flow in its direction by a first flow reversing passage provided at the lower end of said two-cylinder structure whereby the solution flows upwardly and then again reversing the direction of flow by a second flow reversing passage whereby the solution flows downwardly to thereby drive the fine air bubbles out of the culture solution flowing in the outer cylinder, with the resultant bubble-free culture solution being then caused to flow down in the outer cylinder and then guiding the culture solution into the measuring chamber where absorbance of the culture solution is measured continuously while discharging the measured solution into the tank, thereby to allow continuous determination of the optical density of the test solution.

4,075,063

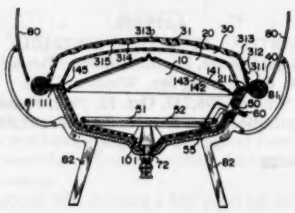
SOLAR POWERED DISTILLING DEVICE

Yaw Jenn Tsay, and Kuo-Chuan Lin, both of No. 10, Lane 177, Pei Hsing St., Chia I, Chia, China/Taiwan

Filed Feb. 17, 1976, Ser. No. 658,692

Int. Cl.[2] B01D *3/00*

U.S. Cl. 202—234 **15 Claims**



1. A distilling device powered by solar energy comprising:

a tray for defining a vaporization chamber;

a transparent cover on said tray;

a transparent condensation plate mounted on said tray;

a transparent corrugated partition mounted on said tray between said tray and said condensation plate so that a top side of said partition defines a condensation chamber with a bottom side of said condensation plate and a bottom side of said partition defines a vaporization chamber with said tray, said condensation plate being mounted between said partition and said cover so that a top side of said condensation plate defines a cooling air chamber with a bottom side of said cover, said partition having a multiplicity of holes defined therein, that portion of said tray forming said vaporization chamber with said partition having attached thereto a layer of insulating material;

fluid inlet means on said tray for conducting fluid to be vaporized into said vaporization chamber;

a plurality of differential focal length solar energy focusing lenses on said cover focusing solar energy through said cooling air and condensation chambers and said partition and said condensation plate onto the fluid located in said vaporization chamber to form vapor which passes through the holes in said partition from said vaporization

chamber into said condensation chamber, said leases having a plurality of different focal lengths to focus solar energy at different levels in said vaporization chamber, thereby focusing solar energy into, on and above water in said vaporization chamber;

air inlet means on said cover for conducting cooling air into said cooling air chamber to contact said condensation plate one side for maintaining said plate at a temperature below the condensation temperature of the fluid in said vaporization chamber so that vapor formed in said vaporization chamber is condensed into condensate upon contact with said plate other side;

a condensate collecting means connected to said tray for collecting the condensate formed on said condensation plate; and

outlet means connected to said condensate collecting means for withdrawing the collected condensate from said condensate collecting means.

4,075,064

PROCESS FOR THE MARKING ON METAL OR THE LIKE SURFACES

Iwao Otsu, and Motohisa Watanabe, both of c/o Kawaguchiko Seimitsu Company Limited, 6663-2, Funatsu, Kawaguchiko, Minamitsuru, Yamanashi, Japan (401-03)

Filed Sept. 30, 1976, Ser. No. 728,057

Claims priority, application Japan, Oct. 1, 1975, 50-118657

Int. Cl.[2] C25D *5/02, 5/34*

U.S. Cl. 204—18 R **6 Claims**

1. Process for the marking of small metallic pieces comprising the steps of:

preparing a smooth metal stock sheet comprising the steps of punching out a smooth metal sheet to form small metallic piece stocks, degreasing said stocks with an organic solvent, placing the degreased stock in a barrel containing fresh water and gravel, rotating the barrel at a slow speed for removing excess fillets from the stocks, removing the stocks from the barrel, and then drying the stocks in a hot air stream;

printing characters or a like fine pattern of 1–10 microns thickness on the stock by an ink transferring step or screen printing step by providing a color printing ink paste having a resisting or impulsing characteristic to a plating bath liquid to be used;

baking the printed pattern; and

plating chemically or electrochemically an anticorrosive metal layer on the surface of said stock, with the exception of the area of said printed pattern so that the printed pattern has a substantially smaller height from the stock than the plated metal layer and presents a sharp contrast to the plated metal layer, said printed pattern being protected by the metal layer from wear caused by contact.

4,075,065

GOLD PLATING BATH AND PROCESS

Alexander Korbelak, Southbury, Conn., and John King, Anaheim, Calif., assignors to Handy & Harman, New York, N.Y.

Continuation-in-part of Ser. No. 593,423, July 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 375,616, July 2, 1973, Pat. No. 3,893,896. This application June 18, 1976, Ser. No. 697,687

Int. Cl.[2] C25D *3/62*

U.S. Cl. 204—43 G **4 Claims**

1. An acidic electrolytic bath for electrodeposition of gold comprising:

a. an alkali gold cyanide in an amount ranging from 0.1 to 50 grams per liter;

b. zirconium oxychloride in an amount ranging from 5 to 250 grams per liter;

c. a weak polyfunctional water-soluble aliphatic carboxylic acid in an amount ranging from 5 to 500 grams per liter;

d. a non-depositing metallic compound in an amount ranging from 5 to 250 grams per liter;

e. a metallic hardener in an amount ranging from 0.01 to 15 grams of metal ion per liter; and

f. water.

2. An acidic electrolytic bath for electrodeposition of gold comprising:

a. an alkali gold cyanide in an amount ranging from 0.1 to 50 grams per liter;

b. vanadyl sulphate in an amount ranging from 5 to 250 grams per liter;

c. a weak polyfunctional water-soluble aliphatic carboxylic acid in an amount ranging from 5 to 500 grams per liter;

d. a non-depositing metallic compound in an amount ranging from 5 to 250 grams per liter;

e. a metallic hardener in an amount ranging from 0.01 to 15 grams of metal ion per liter; and

f. water.

4,075,066

ELECTROPLATING ZINC, AMMONIA-FREE ACID ZINC PLATING BATH THEREFOR AND ADDITIVE COMPOSITION THEREFOR

William Edward Eckles, Cleveland Heights, and Valerie Canaris, Parma, both of Ohio, assignors to R. O. Hull & Company, Inc., Cleveland, Ohio

Filed Jan. 27, 1977, Ser. No. 762,883

Int. Cl.[2] C25D *3/22*

U.S. Cl. 204—55 R **44 Claims**

1. An ammonia-free aqueous acid zinc electroplating bath comprising zinc ions, chloride ions, at least one polyoxyalkylated naphthol, at least one aromatic carboxylic acid or bath-soluble salt thereof, and at least one anionic aromatic sulfonic acid or bath-soluble salt thereof.

37. An additive composition for an aqueous acidic zinc electroplating bath comprising a mixture of:

(a) at least one polyoxyalkylated naphthol,

(b) at least one aromatic carboxylic acid or bath-soluble salt thereof, and

(c) at least one anionic aromatic sulfonic acid or bath-soluble salt thereof.

4,075,067

PRODUCTION OF ALUMINIUM

Kaloo Raj Kumar Bhilotra, Arvida, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Feb. 20, 1976, Ser. No. 659,773

Claims priority, application United Kingdom, Feb. 25, 1975, 7918/75

Int. Cl.[2] C25C *3/06*

U.S. Cl. 204—67 **12 Claims**

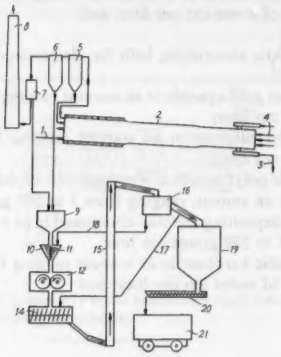
1. A method for the production of aluminium by the electrolytic reduction of alumina, including the steps of

(a) feeding alumina to an electrolytic reduction cell and

(b) passing direct electric current through said cell for reducing the alumina; wherein the improvement comprises

(c) the feeding step comprising feeding, to said cell, alumina comprising calcined alumina particles and from 2 - 50% by weight of granules formed of compacted alumina particles, said particles being particles collected from the exhaust gases issuing from a calcination furnace incident to

calcination of alumina trihydrate therein and having a major proportion by weight of particles of a size less than



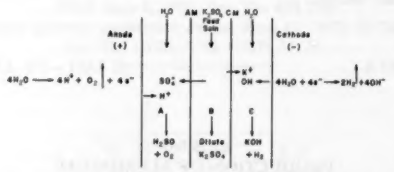
44 microns, said granules having a size in the range of 5000 – 150 microns.

4,075,068

PROCESS FOR THE RECOVERY OF ALUMINUM FROM ALUNITE

Kent W. Loest, Broomfield, and John T. Schaefer, Boulder, both of Colo., assignors to Southwire Company, Carrollton, Ga.; National Steel Corporation, Pittsburgh, Pa. and Earth Sciences, Inc., Golden, Colo.

Filed July 12, 1976, Ser. No. 704,512
Int. Cl.[2] C01D *1/06*
U.S. Cl. 204—93 **8 Claims**



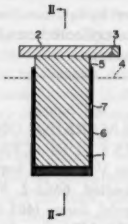
1. A process for producing potassium hydroxide from potassium sulfate by electrodialysis in a single frame electrodialysis cell, said frame comprising: in successive positions, an anode compartment, an intermediate compartment and a cathode compartment, an anion permselective membrane between the anodic and the intermediate compartments, a cation ermselective membrane between the intermediate and cathodic compartments, the arrangement forming anodic and cathodic compartments and an intermediate compartment, which process comprises: adding water to the anodic compartment, potassium sulfate to the intermediate compartment, water to the cathodic compartment, and applying a direct current electrical potential across the solutions to produce potassium hydroxide in the cathodic compartment, sulfuric acid in the anodic compartment and dilute potassium sulfate solution in the intermediate compartment.

4,075,069

PROCESSES FOR PREVENTING THE GENERATION OF A MIST OF ELECTROLYTE AND FOR RECOVERING GENERATED GASES IN ELECTROWINNING METAL RECOVERY, AND ELECTRODES FOR USE IN SAID PROCESSES

Yukio Shinohara, Tokyo, and Kuniki Ueno, Hino, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1976, Ser. No. 669,104
Claims priority, application Japan, Apr. 10, 1975, 50-43516; Apr. 10, 1975, 50-43517
Int. Cl.[2] C25C *1/12*
U.S. Cl. 204—106 **7 Claims**



1. A process for preventing the generation of a mist of electrolyte in the electrowinning metal recovery which is carried out by using an aqueous solution of a metal salt as the electrolyte and insoluble electrode plates to deposit the metal on a cathode without substantially reducing current efficiency, characterized in that the electrode plate(s) is provided with an inert woven fabric screen having an opening of about 5 to about 0.04 mm. in such a manner that the woven fabric screen is in parallel with and close to the electrode plate(s), and the woven fabric screen is extended in such a manner that the upper end of the woven fabric screen is above the level of electrolyte.

4,075,070

ELECTRODE MATERIAL

Donald W. Du Bois, and William B. Darlington, both of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 9, 1976, Ser. No. 694,506
Int. Cl.[2] C25B *1/02, 1/14, 11/10*
U.S. Cl. 204—129 **4 Claims**

1. In a method of electrolysis where an electrical current is passed from an anode through an aqueous electrolyte to a metal cathode whereby to evolve hydrogen at a surface of said metal cathode, the improvement wherein the surface of the metal cathode is an alloy of titanium and a rare earth metal.

4,075,071

METHOD FOR THE TREATMENT OF ESSENTIAL OILS AND WOOD PARTICLES CONTAINING ESSENTIAL OILS

Robert N. Kirschbaum, 1706 Edison St., Brush, Colo. 80723

Filed June 16, 1977, Ser. No. 807,257
Int. Cl.[2] C25B *3/00*
U.S. Cl. 204—136 **17 Claims**

1. The method for the treatment of an essential oil to convert a substantial portion thereof to wood sugars, including the steps of:

a. introducing the oil into an electrolyte solution;
b. immersing a metal anode and a cathode spaced therefrom into the solution; and
c. passing an electrical current through the solution until a substantial portion of the oil is converted to wood sugars.

4,075,072

LASER CHEMISTRY SYNTHESIS OF NF_4BF_4

James A. Merritt, Pulaski, Tenn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 18, 1977, Ser. No. 770,156
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—157.1 R 7 Claims

1. A process for producing NF_4BF_4 comprising placing the gases NF_3, BF_3 and a gaseous compound that gives up fluorine when subjected to laser energy in a reaction container at room temperature and subjecting the gases to a CO_2 laser source for irradiating the reaction chamber and producing NF_4BF_4 as a precipitate.

4,075,073

METHOD FOR THE PREPARATION OF BIS(PERFLUORO-T BUTYL) PEROXIDE

Madeline S. Toy, Palo Alto, and Roger S. Stringham, Woodside, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 23, 1977, Ser. No. 771,858
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—158 R 2 Claims

1. A method for preparing bis(perfluoro-t-butyl) peroxide which comprises the steps of (A) forming a reaction mixture of (1) perfluoro-t-butyl hypofluorite and (2) tetrafluorohydrazine; (B) subjecting said mixture of reactants to photolysis for a period of time and at a temperature sufficient to effect a reaction therebetween; and (C) separating the resultant reaction products.

4,075,074

METHOD FOR PREPARING BENZO[C]CINNOLINE AND ITS DERIVATIVES

Akira Yabe, Fujisawa, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 14, 1977, Ser. No. 777,419
Claims priority, application Japan, June 7, 1976, 51-066258
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—158 R 9 Claims

1. Method for preparing benzo[C]cinnoline or its derivative which comprises irradiating a compound selected from 2,2'-diazidobiphenyl and its derivatives with light in a low-temperature rigid solvent.

4,075,075

PROCESS FOR PREPARING NOVEL SYNTHETIC FIBERS

Ichiro Sakurada, Kyoto; Toshio Okada, Kadoma, and Yutaka Hirano, Kurashiki, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Continuation of Ser. No. 135,451, April 19, 1971, abandoned.
This application June 18, 1974, Ser. No. 480,414
Claims priority, application Japan, Apr. 22, 1970, 45-33798; Apr. 22, 1970, 45-33799
Int. Cl.[2] C08F *8/00*
U.S. Cl. 204—159.17 6 Claims

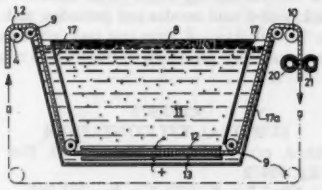
1. A process for preparing synthetic fibers comprising
polymerizing by means of an ionizing radiation acrylonitrile or a mixture of acrylonitrile and a monomer or monomers copolymerizable with acrylonitrile wherein acrylonitrile is present as the major component in a solid vinyl chloride resin matrix
in the presence of a mixture of a liquid hydrocarbon having a small swelling and solvent function selected from the group consisting of ligroin and petroleum benzine and water, each of which substantially acts as a medium for polymerization, so as to provide a polymer blend of the solid vinyl chloride resin matrix and an acrylonitrile polymer matrix-polymerized therein, the total amount of the matrix-polymerized acrylonitrile component being at least about 23% by weight based on the total amount of said polymer blend,
dissolving the polymer blend thus obtained in a solvent to prepare a spinning dope and
spinning said dope to form a fiber.

4,075,076

WATER TREATMENT APPARATUS

Kurt Xylander, Goethestrasse 9, 6234 Hattersheim, Germany

Division of Ser. No. 487,193, July 10, 1974, Pat. No. 3,920,530.
This application Sept. 30, 1975, Ser. No. 618,047
Claims priority, application Germany, June 24, 1974, 2430244
Int. Cl.[2] B03D *1/00*; C02B *1/82*
U.S. Cl. 204—206 16 Claims



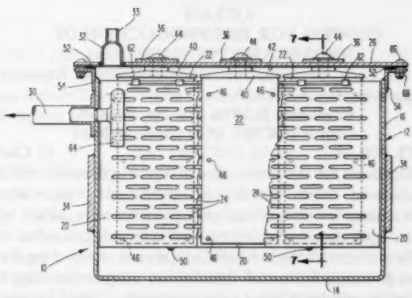
1. Water purification apparatus for purifying dirty water, comprising, in combination: a tank having a first opening for introducing dirty water adjacent one side of said tank, a second opening for removing clean water adjacent an opposite side of said tank, and baffle means extending down on two sides within said tank to separate said openings from a central area at the top of said tank; an endless belt having a plurality of electrodes, said endless belt being trained behind said baffles and through said tank to extend across said tank below said central area near the bottom of said tank; and means for electrically energizing electrodes of said endless belt as they pass below said central area, whereby gas bubbles created by electrolysis from the energization of said electrodes cause solids suspended in the dirty water to be floated to said central area at the top of said tank.

4,075,077

ELECTROLYTIC CELL

Jimmie Ray Hodges, Benton, Ky., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed May 16, 1977, Ser. No. 796,946
Int. Cl.[2] B01K *3/00*
U.S. Cl. 204—269 12 Claims



1. An electrolytic cell for producing alkali metal chlorates from alkali metal chloride brine, comprising:
(a) an electrically conductive tank including a top electrically insulated from a lower portion of the tank;
(b) a plurality of pairs of perforate cathodes within said tank,

each cathode of a pair spaced from and parallel to its paired cathode mate, vertical margins of said cathodes welded to vertical walls of said tank lower portion, perforations through each cathode forming a plurality of horizontal slots;

(c) a plurality of imperforate anodes electrically connected to and suspended from said tank top, resident between cathode mates forming said cathode pairs, at least one anode resident between cathode mates of each cathode pair, each anode spaced apart from the two cathode mates of the associated cathode pair, said cathodes and anodes thereby forming a cathode-anode-cathode-cathode-anode-cathode-cathode-anode-cathode pattern;

(d) means for applying a DC voltage between said insulated tank top and said tank lower portion;

(e) means for introducing alkali metal chloride brine into said tank, below said anodes and cathodes; and

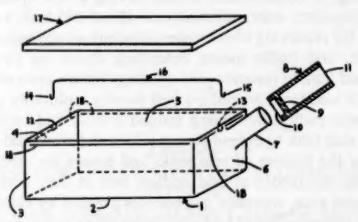
(f) means for withdrawing, from said tank, alkali metal chloride-chlorate liquor produced by electrolysis of said brine.

4,075,078

SURVIVAL KIT CONTAINER

Joe H. Nickell, c/o J. Wendell Nickell P.O. Box 67, West Liberty, Ky. 41472

Filed Jan. 6, 1977, Ser. No. 757,340
Int. Cl.[2] A45C *11/20*
U.S. Cl. 206—546 **3 Claims**



1. A survival kit container comprising a box-like body member having an open side and a closed side, with a pour spout extending at an upward angle from one endwall, said spout being fitted with a threaded tube having a partition closer to one end, the distance to the other end being the length of said spout, whereby said tube when threaded onto said spout serves as a screw-cap, and whereby the opposite end of said tube may alternately be threaded onto said spout for said tube to function as an extension handle when said body member is utilized as a skillet for cooking.

4,075,079

PROCESS FOR THE PRODUCTION OF HYDROCARBONS FROM COAL

Robert J. Lang, Baytown, Tex., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed June 9, 1976, Ser. No. 694,410
Int. Cl.[2] C10G *1/04;* C10B *57/04*
U.S. Cl. 208—8 **11 Claims**

1. A process for the production of liquid hydrocarbons from carbonaceous solids containing volatilizable hydrocarbons which comprises contacting said carbonaceous solids with gaseous hydrogen and a hydrogen-donor solvent under coal liquefaction conditions in a liquefaction zone; recovering liquefaction products from said liquefaction zone; separating said liquefaction products into a gaseous stream, a liquid hydrocarbon stream, and a heavy liquefaction bottoms product; pyrolyzing said liquefaction bottoms product and fresh carbonaceous solids containing volatilizable hydrocarbons in a pyrolysis unti operated at a temperature in excess of about 900° F.; and recovering gases, liquid hydrocarbons, and coke from said pyrolysis unit.

4,075,080

COAL LIQUEFACTION PROCESS WITH REMOVAL OF AGGLOMERATED INSOLUBLES

Everett Gorin, Pittsburgh, Pa., assignor to Continental Oil Company, Ponca City, Okla.

Filed Feb. 18, 1976, Ser. No. 659,180
Int. Cl.[2] C10G *1/04*
U.S. Cl. 208—8 **2 Claims**

1. In a coal liquefaction process employing a liquefaction solvent wherein a product is recovered which contains a solution of coal liquefaction products in said liquefaction solvent as a first component, and as a second component, the undissolved solids suspended in said first component; and wherein said second component is agglomerated in an agglomeration zone by the use of a precipitating solvent, the IMPROVEMENT whereby the agglomerates of the second component formed in said agglomeration zone are separated from the first component substantially free of the desired coal liquefaction product, which improvement comprises:

a. conducting the mixture of said first component and agglomerated second component from said agglomeration zone to an upper settling zone from which a solids-free liquid is recovered, said upper settling zone freely communicating with a lower washing and settling zone which is smaller in cross-section than said upper zone;

b. circulating a wash solvent upwardly through said lower zone and said upper zone at such a flow rate in said lower zone as to establish and maintain a downwardly moving ebullated bed of solids in said lower zone, whereby agglomerates descending from said upper zone through said lower zone are continuously washed by said wash solvent; and

c. withdrawing agglomerates from the bottom of said lower zone.

4,075,081

FLUIDIZED BED HYDRORETORTING OF OIL SHALE

Armand A. Gregoli, Tulsa, Okla., assignor to Cities Service Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 605,117, Aug. 15, 1975, abandoned. This application July 20, 1977, Ser. No. 817,403
Int. Cl.[2] C10G *1/02*
U.S. Cl. 208—11 R **5 Claims**

1. A process for extracting oil from oil shale comprising

(a) crushing the shale to a particle size of from about 10 μ to about 300 μ,

(b) mixing the crushed shale with a hydrocarbon liquid to give a pumpable slurry and heating at least one of the reactor feed component streams,

(c) introducing the slurry, along with a hydrogencontaining gas, into an up-flow, fluidized bed reactor, at a superficial fluid (liquid plus gas) velocity sufficient to move the reaction mixture of gases, liquids, and solids upwardly through the reactor,

(d) hydroretorting the oil shale at a reactor temperature of from about 600° to about 900°, at a reactor pressure of from about 500 to about 3000 psi., at a space velocity between about 0.2 and about 2.0 of tons of fresh shale feed/hr./volume of reactor,

(e) removing the reaction mixture from the reactor as total overhead effluent, and

(f) separating the reactor effluent into two or more component streams.

4,075,082

PROCESS FOR HYDRODESULFURIZATION AND LIQUEFACTION OF CARBONACEOUS STOCKS USING SUSPENDED CATALYST

Louis C. Doelp, Glen Mills; Lee Friedman, Bala Cynwyd, and Maurice M. Mitchell, Wallingford, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 594,883, July 10, 1975, Pat. No. 3,975,259. This application Aug. 13, 1976, Ser. No. 714,035
Int. Cl.[2] C10G *1/08*
U.S. Cl. 208—10 10 Claims

1. A process for desulfurizing and liquefying coal or a similar solid, sulfur-containing carbonaceous material which process comprises:

a. forming, in a liquid hydrocarbon, a combined suspension of the solid carbonaceous material in the form of particles having a major dimension in the range from about 0.1 to about 200 microns and a finely divided hydroyenation catatlyst consisting essentially of particles having a major dimension less than about 10 microns,

b. reacting the combined suspension with hydrogen under hydrogenating conditions of temperature, pressure and a weight hourly space velocity (residence time) from about 200 to about 50,000 kg. of suspension per kg. of the catalyst per hour to produce a hydrogen-treated material containing the catalyst,

c. fractionating the hydrogen-treated material to separate a normally gaseous fraction from liquid materials containing solids, and

d. recovering the liquid containing the solids as product of reduced sulfur content.

4,075,083

METHOD FOR DESTRUCTIVE DISTILLATION OF HYDROCARBONACEOUS MATERIALS

Maurice W. Putman, 8346 E. Valley Vista, Scottsdale, Ariz. 85253

Filed June 11, 1976, Ser. No. 695,061
Int. Cl.[2] C10G *1/02*
U.S. Cl. 208—11 R 6 Claims

1. An improved method for recovering useful liquid products from distillation and combustion products produced by destructive distillation of oil shale and other particulate hydrocarbonaceous material within a gas combustion type of retort and recycling the product gases for use in the retort, the improvement comprising the steps of:

a. removing the distillation and combustion products from the retort at a temperature in the range of 110° F to 200° F in the form of a stream containing oil mist, condensible oil vapors, combustible and noncombustible gases;

b. recovering oil droplets from the oil mist containing stream by passing the stream removed in step a through at least one high velocity cyclone separator;

c. removing condensible hydrocarbons from the stream from which the oil droplets were removed in step b by passage thereof through an absorption column countercurrent to the flow of an absorption oil therethrough;

d. recovering the condensible hydrocarbons from said absorption oil by passage thereof through a desorber;

e. adding a measured amount of air to a portion of the stream from which the condensible hydrocarbons were removed in step c; and

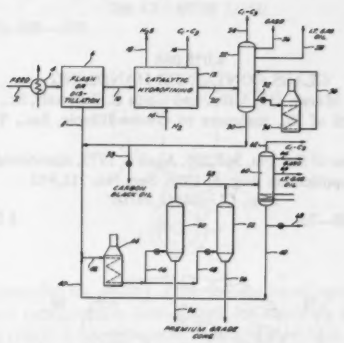
f. directing the stream to which air was added in step e to one end of the retort for flow therethrough countercurrent to the flow of the oil shale and other particulate hydrocarbonaceous materials.

4,075,084

MANUFACTURE OF LOW-SULFUR NEEDLE COKE

Milan Skripek, Fullerton, and John H. Duir, Yorba Linda, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Feb. 17, 1977, Ser. No. 769,421
Int. Cl.[2] C10B *57/02*; C10G *9/14*
U.S. Cl. 208—93 18 Claims



1. A process for the manufacture of needle coke containing less than about 1 weight-percent sulfur from an aromatic mineral oil feedstock having an API gravity between about −6° and +15°, boiling predominantly above about 600° F and containing about 6.5 - 9 weight-percent hydrogen and more than about 0.7 weight-percent sulfur, which comprises:

1. fractionally distilling said feedstock so as to separate a major overhead fraction from a minor bottoms fraction, any asphaltenes present in said feedstock being concentrated in said bottoms fraction;

2. subjecting said overhead fraction to catalytic hydrofining at a temperature correlated with hydrogen pressure and space velocity so as to effect at least about 50% desulfurization of said fraction without raising the hydrogen content of the 500° F+ hydrofiner effluent above about 10.5 weight-percent;

3. recovering from step (2) a heavy hydrofined fraction boiling predominantly above 600° F and blending the same with at least a portion of said minor bottoms fraction so as to form a coking feedstock containing less than about 5 weight-percent asphaltenes; and

4. subjecting said coking feedstock to delayed thermal coking at a temperature correlated with pressure so as to give a needle coke and a coker distillate.

4,075,085

PROCESS FOR TREATING ARSENIC-CONTAINING HYDROCARBON FEEDSTOCKS

Dean Arthur Young, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Sept. 20, 1976, Ser. No. 724,560
Int. Cl.[2] C10G *29/04*
U.S. Cl. 208—253 18 Claims

1. A process comprising

(a) heating at a temperature of at least 300° F a liquid solution comprising (1) a hydrocarbon feedstock containing at least 2 ppmw arsenic, said hydrocarbon feedstock being a synthetic crude, or fraction thereof, obtained from oil shale, solid coal, or tar sands, and (2) an oil-soluble additive comprising one or more nickel, copper, or cobalt components, said heating being carried out for a time sufficient to convert at least some of the arsenic in said solution to arsenic components selected from the class consisting of those extractable in water and those that exist as an undissolved solid at 100°–250° F;

(b) separating at least some of said arsenic components from said solution; and

(c) withdrawing from step (b) a purified oil containing arsenic in a concentration less than that of the feedstock.

4,075,086

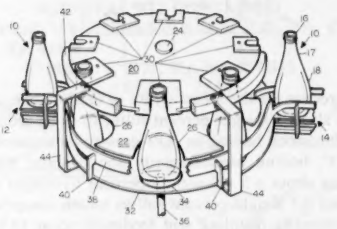
GLASS CONTAINER HANDLING

Samuel W. Marsh, III, Alton, and Keith E. Zumwalt, Sr., Hartford, both of Ill., assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 565,205, April 4, 1975, abandoned. This application Aug. 5, 1976, Ser. No. 711,942

Int. Cl.[2] B65G *29/00*

U.S. Cl. 209—73 **4 Claims**



1. In an apparatus for the inspection of glass containers which removes glass containers one at a time from a continually moving conveyor, wherein said glass containers are indexed through a plurality of inspection stations and acceptable glass containers are returned to an output conveyor for removal, the improvement in said apparatus to allow inspection of glass containers having a finish portion, an elongated neck portion and a flattened main body portion which comprises, in combination:

an upper starwheel;

a plurality of spaced-apart neck holders that are open at their peripheral edges to engage substantially 180° of the circumferences of the neck portion of said glass containers, said neck holders being carried by said upper starwheel and having a height that is at least one-half the height of said neck portion;

a lower starwheel, vertically spaced apart from said upper starwheel, said lower starwheel having a plurality of open pockets formed in the periphery thereof to accept the flattened main body portion of said glass containers, said open pockets being generally in vertical alignment with said neck holders;

a fixed slide plate upon which said glass containers ride during indexing;

a circular spinner pad at at least one of the inspection stations for spinning a glass container positioned thereon;

a lower guide rail positioned to prevent escape of said main body portion of said glass containers from said open pockets in said lower starwheel;

an upper guide rail positioned in contact with said neck portion of said glass containers, said upper guide rail having a height that is at least one-half the height of said neck portion; and

said upper and lower guide rails confining the containers to the area of the pockets in the starwheels but permitting rotation of the containers so confined about their vertical axes.

4,075,087

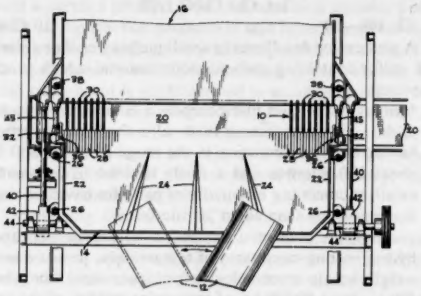
CONTINUOUS GRADER FOR FRUITS OR THE LIKE

Alfred W. Gerrans, San Jose, Calif., assignor to Sunsweet Growers, Inc., Stockton, Calif.

Continuation of Ser. No. 366,624, June 4, 1973, abandoned. This application Oct. 14, 1975, Ser. No. 622,407

Int. Cl.[2] B07B *1/15*

U.S. Cl. 209—99 **8 Claims**



1. A continuous grader for fruits or the like which comprises,

means forming substantially a planar surface arranged to conduct fruit thereacross in substantially a single layer,

a plurality of laterally spaced fingers arranged to receive fruits from said planar surface and to conduct fruits above a predetermined size in rows between said fingers, undersized fruit dropping between the fingers so as to be continuously separated from the lager fruits during their advance, the closest surfaces of adjacent fingers constituting substantially linear edges, and

a plurality of V-troughs interposed between said planar surface and said fingers to orient the fruits passing therebetween.

4,075,088

APPARATUS FOR GRADING OBJECTS ACCORDING TO SIZE

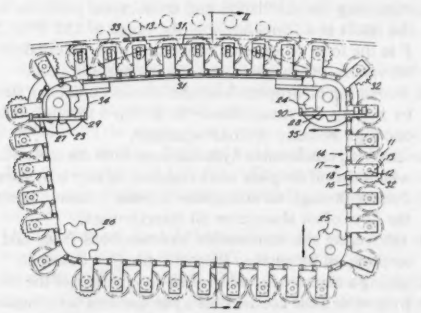
Dougles Charles McRae, Penicuik, and Philip Scott Hutchison, Currie, both of Scotland, assignors to National Research Development Corporation, London, England

Filed June 9, 1976, Ser. No. 694,383

Claims priority, application United Kingdom, June 13, 1975, 25399/75

Int. Cl.[2] B07C *5/04*

U.S. Cl. 209—106 **12 Claims**



1. Apparatus for grading objects according to size, which comprises:

a plurality of spaced apart grading members forming a grad-

ing array for grading objects by allowing objects smaller than the spacing between adjacent grading members to pass between adjacent grading members while retaining on the grading members objects larger than the spacing between adjacent grading members;

support means for the grading members, said support means comprising elongated base means capable of assuming different degrees of curvature along its length, and mounting elements for mounting said grading members on said elongated base means; and

means for selectively varying the curvature of said elongated base means for giving a degree of curvature selectable from a range of different curvatures;

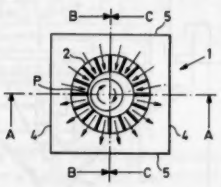
said mounting elements being secured on said elongated base means at spaced intervals along the length of the elongated base means, said spaced intervals remaining constant during operation of the apparatus, and said grading members being mounted on outstanding portions of said mounting elements at positions spaced from said elongated base means in directions normal to the length of the elongated base means, whereby variation of the curvature of said elongated base means causes said outstanding portions of said mounting elements to fan out or to close up so that said grading members spread apart or come towards each other in order to selectively vary the grading spacing between adjacent grading members.

4,075,089

FLOTATION CELL WITH ECCENTRIC ROTOR AND STATOR

Kaarlo Matti Juhani Saari, Vanha-Ulvila, and Aarno Iisakki Kalliokoski, Ulvila, both of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Jan. 10, 1977, Ser. No. 757,951
Claims priority, application Finland, Jan. 13, 1976, 760066
Int. Cl.² B03D *1/24*
U.S. Cl. 209—169 **2 Claims**



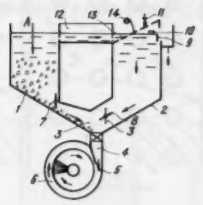
1. A flotation cell for separating by flotation a material from a mixture of the material in a liquid vehicle, comprising a vessel for the mixture provided with at least one upper edge for discharge of substantial amounts of the material thereover, a fixed annular stator provided in the bottom of said vessel and having radial passages therethrough, the axis of said stator being substantially parallel with the vertical axis of said vessel, a rotor disposed within said annular stator for impelling the mixture, the axis of said rotor being substantially parallel with the axis of said stator and spaced therefrom so that one side of said rotor is spaced from the inner surface of said annular stator a greater distance than the opposed side of said rotor and means for rotating said rotor whereby the mixture of the material in the liquid vehicle flows inwardly through the radial passages on that side of said stator where the distance between said rotor and said stator increases in the direction of rotation of said rotor and flows outwardly through the radial passages on the opposed side of said stator thus providing a flow of the mixture across the top of said vessel in substantially one direction toward the discharge edge of said vessel.

4,075,090

APPARATUS FOR GRAVITY COLLECTING AND HANDLING OF PRODUCTS FROM TANKS FILLED WITH LIQUID FOR DEWATERING DEVICES

Antoni Jedo, Gliwice, and Waclaw Jachna, Tychy, both of Poland, assignors to Centralny Osrodek Projektowo-Konstrukcyjny Maszyn Gorniczych "Komag", Gliwice, Poland

Filed July 30, 1976, Ser. No. 710,243
Claims priority, application Poland, Aug. 2, 1975, 182522
Int. Cl.² B03B *11/00*
U.S. Cl. 209—173 **7 Claims**



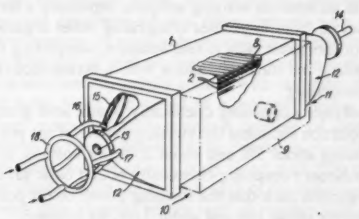
1. Apparatus for gravity collection and handling of granular products comprising a feeding tank for receiving liquid containing granular materials to be separated therefrom, said feeding tank having a lower outlet, at least one equalizing tank having a lower outlet, a communicating passage connecting said feeding tank and said equalizing tank, a second passage connecting the outlets of said tanks, at least one discharge conduit connected to said second passage, a dewatering device having an inlet nozzle connected to said discharge conduit, a restrictor disposed at said outlet of the feeding tank for controlling flow therefrom, regulating means at the outlet of the equalizing tank for regulating discharge therefrom, said equalizing tank having an overflow crest located at a level at least as high as that of the liquid in the feeding tank.

4,075,091

METHOD FOR EFFECTING HEAT OR MASS TRANSFER

Brian John Bellhouse, Wendlebury, near Bicester, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 371,986, June 21, 1973, abandoned. This application Apr. 29, 1975, Ser. No. 572,826
Claims priority, application United Kingdom, June 28, 1972, 30288/72; Mar. 29, 1973, 15117/73
Int. Cl.² B01D *13/00*; A61M *1/03*
U.S. Cl. 210—19 **6 Claims**



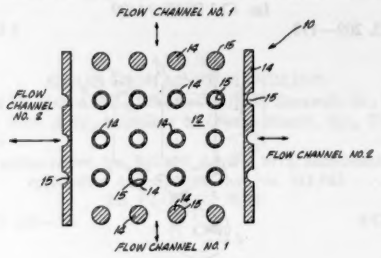
1. A method for effecting heat or mass transfer between blood and a fluid through a transfer membrane, in which oneof said fluids is passed in pulsatile flow through a conduit at least partly defined by the membrane to give rise to substantially non-turbulent rotatory secondary fluid flow pattern in each of successive hollows in the membrane, the rotatory flow having components of motion parallel and components of motion perpendicular to the general direction of flow in the conduit.

4,075,092

HIGH SURFACE AREA PERMEABLE MATERIAL

Eugene W. White; William M. Hanusiak, both of State College, Pa., and Rodney A. White, Torrance, Calif., assignors to Research Corporation, New York, N.Y.

Filed Aug. 10, 1976, Ser. No. 713,258
Int. Cl.[2] B01D 3/00
U.S. Cl. 210—22 R 30 Claims



1. An integral three-dimensional structure providing a plurality of separate interpenetrating, three-dimensional domains or channels, each of said domains or channels being a closed system of connected porosity or permeability with multiple interconnections only with respect to its respective domain or channel, each of said domains or channels being interpenetrating within said structure.

4,075,093

PROCESS OF SEPARATING CITRIC ACID AND/OR ISOCITRIC ACID OR THEIR SALTS FROM AQUEOUS SOLUTIONS

Axel Walch; Albrecht Klimmek, both of Frankfurt am Main, and Klaus Wollmann, Eschhofen, all of Germany, assignors to Joh. A. Benckiser GmbH, Ludwigshafen (Rhine), Germany

Filed Oct. 23, 1975, Ser. No. 625,140
Claims priority, application Germany, Oct. 25, 1974, 2450670
Int. Cl.[2] B01D 13/00
U.S. Cl. 210—23 H 15 Claims

1. A process of separating a material selected from citric acid, isocitric acid, their salts, and mixtures of such materials, present in an aqueous starting solution, especially a fermentation solution, from impurities comprising other organic compounds or inorganic salts in said solution, comprising the step of contacting the starting solution with a permselective membrane comprising

a. a polymer containing chemically bound acid groups in a proportion such that the swelling power of the polymer is between about 5% and about 25%, by volume, or

b. a polymer containing chemically bound basic groups in a proportion such that the swelling power of the polymer is between about 3% and about 15%, by volume,

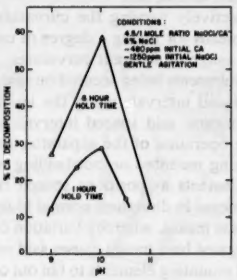
at a pH-value between about 0.1 and about 8.0 and under a pressure between about 5 bars and about 100 bars for the acidic polymers (a) and at a pH-value between about 1.0 and 3.0 and under a pressure between about 30 bars and about 100 bars for the basic polymers (b) whereby a permeate solution and a retention solution result on opposite sides of said membrane, one of said resulting solutions having a substantially higher ratio of said material to said impurities than in said starting solution.

4,075,094

SODIUM HYPOCHLORITE TREATMENT FOR REMOVAL OF CYANURATE COMPOUNDS FROM AQUEOUS WASTE STREAMS

Ronald H. Carlson, Willingboro, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed July 9, 1976, Ser. No. 704,051
Int. Cl.[2] C02B 1/36
U.S. Cl. 210—62 26 Claims



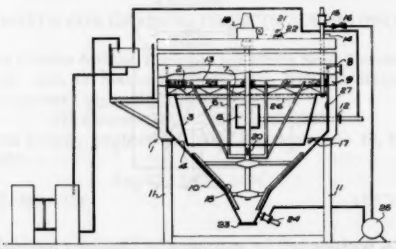
1. A process of eliminating dissolved cyanurate compounds from waste liquors containing triazines such as cyanuric acid, ammelide, and chlorinated isocyanurates comprising adjusting the pH of said waste liquors within the range of 8 to 12, and adding thereto at a temperature below 55° C sufficient sodium hypochlorite to oxidize a major portion of said cyanurate compounds to nitrogen, carbon dioxide and sodium chloride.

4,075,095

TREATMENT OF EFFLUENT

Derek Parnaby, Bridge End Ferryhill Station, Durham, England

Filed June 14, 1976, Ser. No. 695,459
Int. Cl.[2] B01D 23/24
U.S. Cl. 210—82 9 Claims



1. A sand settler filter comprising

a scum tank (1) having an upper part and a bottom (10);

a scum trough (9) mounted on the tank and a weir (8) carried by the upper part of the scum trough (9) to locate the weir (8) between the scum trough (9) and the upper part of the tank (1);

a perforate support (2) forming a filter bed carried across the scum tank (1) below said weir (8) and a filter medium (13) located on the support (2);

means (3) within the tank defining a ballast chamber having a lower opening (4) extending into the remaining portion of the tank (1) below the support (21)

an effluent feed (5) located below said perforate support (2) to feel effluent to the filter, back pressure sensing means (27) responsive to pressure in said ballast chamber;

and valve means (15, 23, 24) forming valved outlets from the tank controlled by said sensing means to open the outlet when a predetermined back pressure is sensed and includ-

ing a valved gas outlet (15) communicating with the upper region of the ballast chamber responsive to the pressure therein sensed by the sensing means (27).

7. Method of treatment of effluent in a scum tank (1) having an upper part and a bottom (10);

a scum trough (9) mounted on the tank and a weir (8) carried by the upper part of the scum trough (9) to locate the weir (8) between the scum trough (9) and the upper part of the tank (1);

a perforate support (2) forming a filter bed carried across the scum tank below said weir (8) and a filter medium (13) located on the support (2);

means (3) within the tank and defining a ballast chamber having a lower opening (4) extending into the remaining portion of the tank (1) below said support (2);

comprising the steps of

distributing effluent from the effluent feed within the tank;

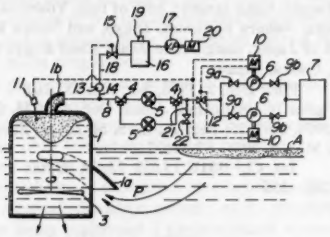
allowing the effluent to percolate the support and filter bed, to settle sludge below in the tank and cause treated liquor to rise to the weir for subsequent discharge from the scum trough (9);

and purging scum at the perforate support (2) and backwashing the filter bed by dropping the level of effluent in the tank.

4,075,096
SUCTION DEVICE FOR AN OIL SEPARATION TANK

Hiroshi Kawakami, Kamakura; Yukio Tsukagawa, and Isao Nagaoka, both of Yokohama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Sept. 16, 1976, Ser. No. 723,865
Claims priority, application Japan, Sept. 18, 1975, 50-127279
Int. Cl.[2] B01D *21/24*
U.S. Cl. 210—96 R 3 Claims

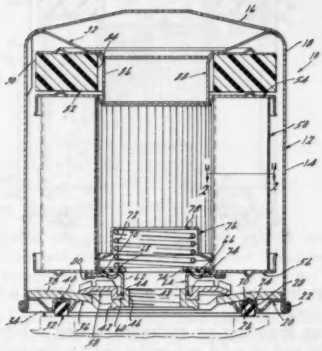


1. In a suction device for an oil separation tank, the tank being mounted on a floating body and closed at its upper part and opened at its lower part and including a socket opened below water level for receiving an upward flow of floating oil which has been drawn into water, the improvement comprising, a suction inlet provided at the top of said oil separation tank; said suction inlet being connected through a conduit to strainer means, liquid pump means and a storage tank in succession; a motor driving said liquid pump means; an oil detector provided in the upper part of said oil separation tank and electrically coupled to said motor so as to control energization and deenergization of said motor in response to the presence and absence of oil in said oil separation tank; an electromagnetic valve connected to said conduit and upstream of said liquid pump means; said electromagnetic valve coupled to said motor to be opened and closed in response to the energization and deenergization of said motor; said conduit including a branch downstream of said oil separation tank; a full water detector coupled to said branch; said full water detector connected through an air conduit to a second electromagnetic valve, a vacuum vessel and a vacuum pump in succession; said full water detector electrically connected to said second electromagnetic valve to control its opening and closing; a second motor for driving said vacuum pump; and said vacuum vessel including a vacuum switch which serves to control energization and deenergization of said second motor.

4,075,097
OIL FILTER WITH OIL IMPROVING DISSOLVING BODY

George A. Paul, Midland, Mich., assignor to Monroe Auto Equipment Company, Monroe, Mich.

Filed Apr. 1, 1975, Ser. No. 564,111
Int. Cl.[2] B01D *35/00*; C10M *7/10*
U.S. Cl. 210—168 16 Claims



1. An oil filter for an engine having a circulating oil lubrication system,

said filter including an enclosure having a generally cylindrically-shaped side wall and having an annular ring-shaped filter element located concentrically therein,

a base plate at one end of said enclosure having a generally centrally located oil outlet opening and at least one oil inlet opening spaced radially from said outlet opening,

said filter being of the spin-on type and adapted to have said base plate mounted on a support structure having a mounting element threadably receivable within said outlet opening of said base plate,

a first oil passage within said enclosure and located between the inner periphery of the side wall of said enclosure and the adjacent portion of the outer periphery of said filter element communicating said oil inlet opening with the entire axial length of said adjacent portion of the outer periphery of said filter element,

a second oil passage within said enclosure communicating the inner periphery of said filter element with said oil outlet opening, an annular body located at a position at the opposite end of said enclosure from said base plate and being substantially axially aligned with said filter element, said body being fabricated of a material having oil improver properties and which is capable of going into solution in the oil when the oil comes in contact therewith, said position of said body being such that oil must flow axially along the entire length of the outer periphery of said filter element before said oil reaches said annular body, with the result that said body is located where relatively limited amount of oil movement occurs, whereby said polymer body will be substantially unaffected by the mechanical movement of oil within said enclosure and will dissolve into the oil at a relatively uniform rate over the normal service life of the oil and thereby assure against over and underdosing of the improver properties being replenished into the oil in said system by dissolution of said polymer.

4,075,098

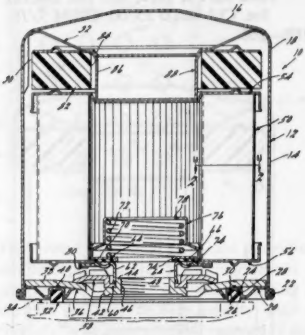
MASKING ELEMENTS FOR DISSOLVING OIL IMPROVING BODY IN AN OIL FILTER

George A. Paul, Midland; Robert W. Hegel; Michael R. Bethell, both of Monroe; Charles L. Branham, La Salle, and Allan D. Utter, Trenton, all of Mich., assignors to Monroe Auto Equipment Company, Monroe, Mich.

Continuation-in-part of Ser. No. 564,111, April 1, 1975. This application Nov. 7, 1975, Ser. No. 630,038

Int. Cl.[2] B01D *35/00*; C10M *7/10*

U.S. Cl. 210—168 7 Claims



1. A spin-on type oil filter for an engine having a circulating oil lubrication system,

said filter including an enclosure having a filter element therein and oil inlet and outlet ports communicable with the lubrication system of the engine, whereby oil may flow from the lubrication system through said filter element and back into the lubrication system,

an oil soluble, relatively solid body disposed within said enclosure and having oil improver properties,

said body comprising a generally flat, annular member arranged concentrically within said enclosure at a position generally axially aligned with said filter element and at the opposite end thereof from said inlet and outlet ports,

means defining a fluid flow path along which oil flows within said enclosure between said filter element and said ports, and

a masking element independent of said enclosure and arranged at a position therein between a preselected surface portion of said annular member and a portion of said flow path so as to limit the disturbance of the concentration gradient between the oil and the member by the mechanical movement of the oil along said flow path, whereby said body will dissolve into the oil at a preselected rate over the service life of the oil,

said element comprising a generally radially disposed portion located directly adjacent the upper side of said member, and a generally axially disposed portion extending axially downwardly along the axially outermost part of said member.

4,075,099

INTEGRAL OIL SUPPLY AND FILTER

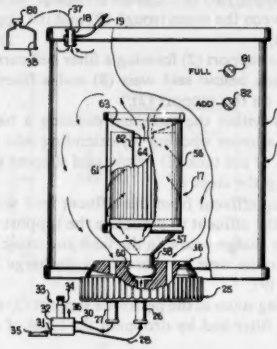
Peter G. Pelton, Carol Stream; Alan A. Grubman, Glenview, and Gary Hasegawa, Morton Grove, all of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Sept. 2, 1975, Ser. No. 602,074

Int. Cl.[2] F01M *1/02*

U.S. Cl. 210—168 10 Claims

1. A new article of manufacture comprising a disposable oil unit for a dry sump lubricating system, said oil unit including a disposable container of a construction suitable for transporting oil, said container being of a size to be the primary oil storage area for an intended machine, a fitting carried by said container, said fitting defining an inlet passage for directing oil into said container, a filter, said filter being small in size as compared to said container, coupling means coupling said filter to said fitting for receiving oil through said inlet passage, said filter having a discharge opening into said container, and means for delivering oil from said container for passage through a unit to be lubricated, said means for delivering oil



from said unit including said fitting defining an outlet passage, said fitting having an end face remote from said container, said inlet passage being generally centrally located and said end face having projecting therefrom a first sealing ring, said end face having a second sealing ring projecting therefrom surrounding said fist sealing ring, and said outlet passage being disposed between said sealing rings.

4,075,100

DIALYSIS UNIT AND DIALYSIS APPARATUS EMPLOYING THE DIALYSIS UNIT

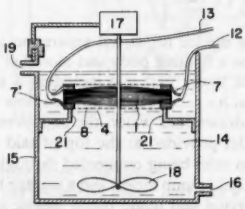
Tadaaki Furuta; Kenji Inagaki, both of Fuji; Yoshiyuki Mizoguchi, Ohita; Noboru Fujikawa, Tokyo, and Naoya Kominami, Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 2, 1975, Ser. No. 637,102

Claims priority, application Japan, Dec. 4, 1974, 49-138979; Dec. 30, 1974, 50-1125; Feb. 24, 1975, 50-22620; Feb. 25, 1975, 50-23064; Mar. 8, 1975, 50-28407

Int. Cl.[2] B01D *13/00, 21/24, 35/00*

U.S. Cl. 210—266 9 Claims



1. A liquid dialysis unit comprising:

a protective casing having a plurality of openings for introducing and discharging a dialyzate, said openings being substantially uniformly distributed all over the casing; and

a bundle of semi-permeable hollow fibers substantially equal in length, both end portions of the bundle of fibers being gathered and bonded in liquid-tight connection to form fixation blocks, respectively, both terminals of the bundle being opened to form an inlet and an outlet for the liquid, respectively, said bundle being supported within the protective casing at at least two supporting points; said semi-permeable hollow fibers being supported and arranged to have a relaxation rate of 3 to 30% at a position between any two adjacent supporting points; and said protective

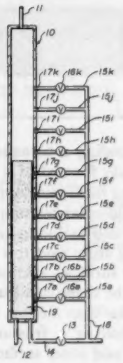
casing having a diameter 1.5 to 6 times as large as the close package diameter of the bundle.

4,075,101

APPARATUSES FOR FLUIDIZING A FILTER MEDIA PLUG

Matthew H. Fuller, Richmond, Va., and William R. Deever, Beaumont, Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 600,259, July 30, 1975, abandoned. This application June 17, 1976, Ser. No. 697,293
Int. Cl.[2] B01D *23/24*
U.S. Cl. 210—275 **13 Claims**



1. In a rapidly fluidizing granular media filter having a plug of filter media therein which is required to be rapidly broken up and fluidized, the filter comprising,

(a) chamber means having an inlet means for supplying a filter influent in the top thereof and an outlet means for discharging effluent from the bottom thereof in which a filter media plug is formed,

(b) first plug-breaking-up means mounted on said chamber means at a predetermined distance above the bottom of said plug for ejecting a horizontal high pressure liquid jet at said plug for contacting and breaking up the lower portion of said plug,

(c) a multiplicity of successive plug-breaking-up means for said vertical chamber means, each plug-breaking-up means being positioned a predetermined distance above the previous plug-breaking-up means to the top of said plug for rapidly breaking up and fluidizing said filter media plug, and

(d) all of said plug-breaking-up means are mounted equal distances apart.

4,075,102

LIQUID PROCESSING MEDIA BED DRAIN SYSTEM

Charles Robert Ferrin, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 13, 1976, Ser. No. 685,955
Int. Cl.[2] B01D *29/42*
U.S. Cl. 210—277 **5 Claims**

1. A fluid processing unit, including,

a vessel in which fluid is processed by being passed through granular media;

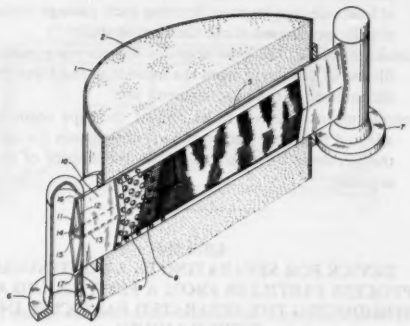
a bed of granular media mounted in the vessel so as to provide horizontal and parallel faces vertically spaced from each other through which fluid to be processed is passed into the bed for processing,

inlet conduits mounted through the wall of the vessel and positioned relative to the upper and lower faces of the bed so as to direct fluid to be processed through each face at the same time;

a source of fluid to be processed by the bed of granular media;

a pump connected between the source and inlet connections to deliver fluid to be processed to the bed faces and through both bed faces and into the bed;

a drain structure mounted in the vessel and intermediate the bed faces and within the bed and extending horizontally across the bed and comprising;



an elongated chamber orientated to extend horizontally across the bed, and having a chamber thickness substantially smaller than its vertical width to thereby provide a relatively small profile to the vertical movement of the media bed within the vessel, said elongated chamber having spaced holes in its wall through which fluid processed by the bed is received into the chamber;

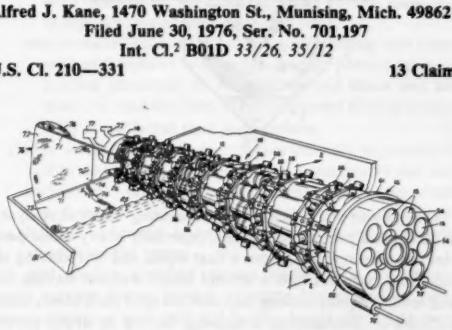
an an outlet conduit connected to communicate to the chamber to remove the processed fluid from the vessel.

4,075,103

FABRICATED DISC FILTER CORE

Alfred J. Kane, 1470 Washington St., Munising, Mich. 49862

Filed June 30, 1976, Ser. No. 701,197
Int. Cl.[2] B01D *33/26, 35/12*
U.S. Cl. 210—331 **13 Claims**



3. In a filter disc assembly for use in conjunction with a tank containing a slurry, an elongated central shaft, a plurality of radiating segmented filter discs having hollow interiors operably connected to and supported by said central shaft, means for rotatably mounting the central shaft above the tank such that when the shaft rotates, the segmented disc will rotate and each segment of filter disc alternately enters and withdraws from the tank, and passages through the central shaft circumferentially positioned about the central axis thereof through which a vacuum means is operably connected to the interior of the filter discs, the improvement in the rotatable shaft comprising:

a plurality of replaceable pipe segments each having a hollow interior and secured circumferentially about the central axis of the shaft;

an elongated frame comprising at least one reuseable securing means intervally spaced along the elongated frame between two ends of the frame for replaceably securing

each pipe segment circumferentially about the elongated frame such that one pipe segment is releasable from the securing means and a replacement pipe segment is securable to the same securing means;

the securing means being operable independently of the filter disc segments which are operably connected to the pipe segments;

each pipe segment has its axis substantially parallel to the central axis of the elongated frame, the hollow interior of at least one pipe segment forming each passage circumferentially positioned about the central shaft;

intake means in the pipe segment for allowing passage of filtrate of the slurry from the interior of the filter discs to the interior of the pipe segment; and

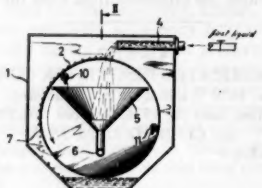
egress means coupled to an end of the pipe segment and adapted to be coupled to the vacuum means for allowing the filtrate to be withdrawn from the interior of the pipe segment.

4,075,104

DEVICE FOR SEPARATING IN A CONTINUOUS PROCESS PARTICLES FROM A FIRST LIQUID AND INTRODUCING THE SEPARATED PARTICLES INTO A SECOND LIQUID

Helmut Ringel, Hambach, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Sept. 15, 1975, Ser. No. 613,267
Claims priority, application Germany, Sept. 13, 1974, 2443843
Int. Cl.[2] B01D *33/06*
U.S. Cl. 210—402 **6 Claims**



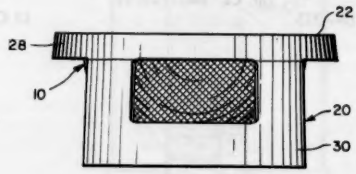
1. A device for continuously separating easily destroyable particles in a protective manner, especially heavy metal particles for core reactors, from a first liquid and introducing the separated particles into a second liquid without having first and second liquids coming into contact with each other, which includes in combination: a housing having an upper portion and a lower portion, an endless screen rotatably arranged in said housing, and defining a hollow chamber therein, a feeding conduit extending into the upper portion of said housing and having its mouth above said screen for feeding and discharging a first liquid with the particles to be separated therefrom onto the screen portion therebelow, liquid catching container means arranged within said hollow chamber below the mouth of said feeding conduit for collecting the liquid discharged from said mouth and passing through said screen, said container means having an outlet extending through said housing to discharge the liquid collected by said liquid catching container means, said lower portion of said housing forming a chamber means for holding a second liquid to receive the particles screened out from the first liquid discharged by said feeding conduit onto and screened out by said screen and remaining only on the outer surface of said screen, and means for setting liquid level of the second liquid.

4,075,105

STACKABLE COLANDER AND BASE

Fred S. Steiner, Woodmere, and Morison S. Cousins, Plainview, both of N.Y., assignors to Bonny Products, Inc., Hewlett, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,567
The portion of the term of this patent subsequent to Dec. 6, 1991, has been disclaimed.
Int. Cl.[2] B01D *23/00*
U.S. Cl. 210—477 **3 Claims**



1. An apparatus including a colander having a supporting rim and a colander body formed of a permeable material attached to and depending from said supporting rim and a colander supporting base, said colander supporting base being open at the top and bottom and including a top wall and a pair of arcuate legs depending from said top wall, said arcuate legs having inner and outer surfaces, said outer surface of said legs imparting to said base the shape of a frustum of a cone with the bottom of said base wider than the top, the inner surface of said pair of arcuate legs having a frustum shape geometrically similar to the shape of said outer surface, said top wall having a recess adapted to receive and supporting said colander rim on said base top wall with said colander body suspended between said legs, whereby said colander and base is stackable with other paired colanders and bases with said inner surface of one of said paired colanders and bases securely resting upon said geometrically similar outer surface of another of said paired colanders and bases.

4,075,106

FILTERING DEVICE

Masahiko Yamazaki, 15-2 2-chome, Fujizuka, Kohoku Yokohama, Japan

Continuation-in-part of Ser. No. 685,685, May 12, 1976, abandoned. This application Dec. 2, 1976, Ser. No. 747,046
Claims priority, application Japan, May 7, 1976, 51-57411[U]
Int. Cl.[2] B01D *39/18*
U.S. Cl. 210—487 **6 Claims**

1. In a filtering device having a cylindrical member with a large number of holes therein and a flexible sheet-like porous filter element surrounding the cylindrical member, said filter element being folded in zigzag fashion so as to present a plurality of radially crosswise extending projections and root regions defined between every two adjacent projections, the improvement comprising:

a large number of rigid passage plates each interposed between the inner edge of the radially crosswise extending projections and the outer wall of the cylindrical member, said passage plates being provided with a plurality of convex and concave portions on both sides thereof and having a width equal to or larger than a distance between

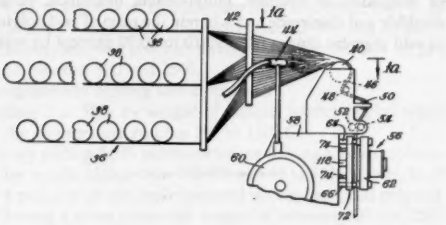
the inner wall of the apex of the projecting folded portion of the filter element and the outer wall of the bottom of the root region defined between every adjacent projecting folded portions, and at least one annular support band surrounding and contacting substantially only the apexes of the folded projections and having its inner wall coated with an adhesive, which provides means to fix said apexes to said support band, said adhesive permeating through the apexes of said folded projections to further provide means to fix said apexes to the outer edge of the passage plates.

4,075,107

NOVEL FILTER AND METHOD OF MAKING SAME

Floyd S. Smith, Kalamazoo, Mich., assignor to Brown Company, Kalamazoo, Mich.

Filed July 14, 1976, Ser. No. 705,066
Int. Cl.[2] B01D *27/06, 29/06*
U.S. Cl. 210—493 R **7 Claims**



1. A seamless filter cupcomprising a unitary sheet of filter paper having integral fluted side portions flaring outwardly from a dish-shaped bottom, in which the dish-shaped bottom has parallel side edges and arcuate end edges, and in which the dish-shaped bottom has substantially planar side portions which converge from said parallel side edges to a center line which is shorter than said parallel side edges and is parallel thereto, and having a mirror image symmetry about its longitudinal, transverse, and perpendicular axes.

4,075,108

POLYCARBONATE MEMBRANES AND PRODUCTION THEREOF

Willard S. Higley, Glendora; Paul A. Cantor, Los Angeles, and Bruce S. Fisher, Covina, all of Canada, assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Continuation-in-part of Ser. No. 454,939, March 26, 1974, abandoned. This application Nov. 28, 1975, Ser. No. 636,062
Int. Cl.[2] B01D *39/16;* **B29D** *27/04*
U.S. Cl. 210—500 M **25 Claims**

1. A process for producing a polycarbonate membrane useful for hemodialysis which comprises casting on to a substrate surface having a smooth finish a layer of casting solution comprising a polyether-polycarbonate block copolymer having a molecular weight within the range of from about 50,000 to about 750,000 as determined by the intrinsic viscosity measurement and containing from about 5 to about 35% by weight of repeating alkylene ether units and correspondingly from about 95 to about 65% by weight of repeating bisphenol A-carbonate units and a water-miscible organic solvent together with a cosolvent which acts as a swelling agent for said copolymer, drying said layer to partially evaporate the solvents therefrom, immersing said partially dried layer in water to form a gelled membrane, and stripping said gelled membrane from said substrate surface.

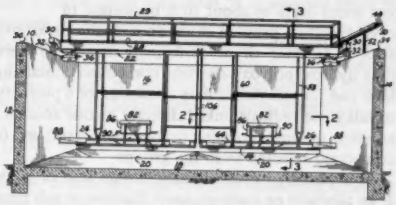
14. The polycarbonate membrane produced in accordance with the process of claim **1**.

4,075,109

SETTLING TANK SLUDGE COLLECTOR

Eugene D. Blalock, P.O. Box 353, Pauls Valley, Okla. 73075

Filed Jan. 27, 1977, Ser. No. 762,914
Int. Cl.[2] B01D *45/02*
U.S. Cl. 210—527 **2 Claims**



1. A sludge and sediment collector for a longitudinal settling tank having a flat bottom and having a sump adjacent one of its ends, comprising:

bridge means transversely spanning said tank and operable for reciprocating movement between its ends;

friction wheel drive means for reciprocating said bridge means,

said friction drive means including a drive support bracket connected in depending relation with the respective end of said bridge means,

a reversible motor operatively connected with a source of electrical energy,

a pneumatic tire equipped wheel connected with and driven by said motor about an axis generally parallel with respect to the vertical plane of the respective bridge supporting tank wall, and,

means including a plate pivotally connecting said wheel with said support bracket in a manner permitting gravitational attraction for the mass of said wheel and said motor to maintain said tire in frictional driving contact with the adjacent tank wall surface;

sludge scraping means generally horizontally supported by said bridge means adjacent the upper surface of said tank bottom for vertical tilting movement about a horizontal axis from a sludge collecting position during movement toward said sump to an idle position during movement away from the sump,

said sludge scraping means including a rectangular scraper frame having a center bar extending transversely of said tank and having longitudinal side members,

said scraper frame having a pair of end members and a pair of transverse braces connecting one said frame side member with said center bar in a horizontal plane and connecting the other said frame side member with said center bar in a plane inclined upwardly with respect to the horizontal when said scraper frame is in one position, and,

a scraper blade secured to one said scraper frame side member; and,

cam plate means including an elongated arcuately curved plate secured at one end to the inner surface of the respective tank end wall and projecting, at its other end, toward an intermediate portion of the respective said scraper frame side member a distance sufficient for contacting the respective scraper frame side member when in one position and tilting said frame to the other of its positions.

4,075,110

FABRIC TREATMENT COMPOSITIONS

Bryan Duffin, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Apr. 2, 1976, Ser. No. 673,022

Claims priority, application United Kingdom, Apr. 15, 1975, 15450/75

Int. Cl.[2] D06M *13/20*

U.S. Cl. 252—8.8 **9 Claims**

1. A fabric treatment composition comprising

A. from about 0.1% to about 10% by weight of

i. a condensation product of (a) an aliphatic dicarboxylic acid, or an ester- or amide-forming derivative thereof; (b) a hydroxypolyoxy-alkylene compound containing at least one polyalkylene chain consisting of a plurality of oxyalkylene radicals linked directly to one another, or an ester- or amide-forming derivative thereof; and (c) a compound selected from the groups

1. an aliphatic or cycloaliphatic amino acid or lactam,
2. an aliphatic or cycloaliphatic diamine or salt thereof with aliphatic dicarboxylic acid,
3. a mixture of the amino acid or lactam compound with the diamine compound or salts thereof, and
4. an ester- or amide-forming derivative of reactants 1), 2) or 3) above; or

ii. a reaction product of an alkylene oxide with polyamide; in an admixture with

B. from about 1% to about 60% by weight of a cationic fabric softener compound having a solubility in water not greater than 500 parts per million at 25° C and

C. an aqueous medium.

4,075,111

HEAVY METAL CHALCOGENIDE-POLYIMIDE LUBRICATIVE COMPOSITES

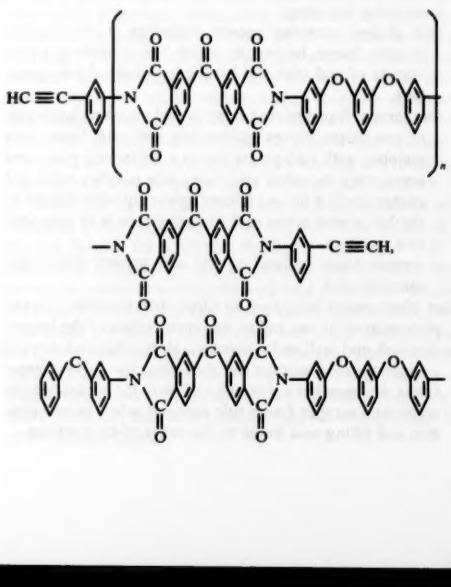
Norman Bilow, Encino, and Michael N. Gardos, Culver City, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 19, 1976, Ser. No. 678,285

Int. Cl.[2] C10M *5/00, 7/00;* **F16D** *69/00;* **F16C** *0/00*

U.S. Cl. 252—12 **4 Claims**

1. A self-lubricating composite comprised of an addition type polymerization polyimide taken from the group consisting of an acetylene-terminated polyimide oligomer selected from the group whose structures consist of:



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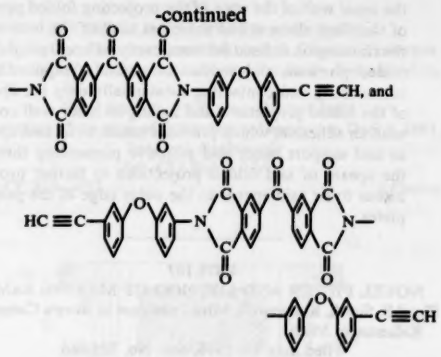


,where, N is 1-3, blended with a solid lubricative pigment taken from the group of heavy metal chalcogenides consisting of molybdenum disulfide, molybdenum diselenide, tungsten disulfide and diselenide and wherein the ratio of said polyimide to said pigment ranges from 90:10 to 30:70 percent by weight.

4,075,112

GREASE COMPOSITION

Guy Camille Van Doorne, Zellik, Belgium, assignor to Labofina S.A., Brussels, Belgium

Continuation-in-part of Ser. No. 544,687, Jan. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 327,787, Jan. 29, 1973, abandoned. This application June 25, 1976, Ser. No. 699,853

Int. Cl.[2] C10M *1/24, 3/18, 5/14, 7/20*

U.S. Cl. 252—35 **8 Claims**

1. A lubrication grease composition consisting essentially of 2 to 8% by weight of an aluminum fayy acid soap, 25 to 98% by weight of hydrogenated polyisobutylene having a mean molecular weight ranging from 300 to 2500, 2 to 58% mineral lubricating oil, and 0.2% polyisobutylene having a mean molecular weight higher than 100,000, and also having a worked penetration in the range of about 285 to 340 and a wear index in the range of about 0.63 to 0.74.

5. A process for the manufacture of lubricating greases which comprise:

dispersing at 15°-50° C 2 to 8% by weight, based on the total composition, of aluminum fatty acid soap, into 10 to 50% by weight of a hydrogenated polymer of polyisobutylene said polymer having a mean molecular weight of between 300 and 2500.

progressively heating said dispersion,

adding 2 to 58% by weight of mineral lubricating oil when the temperature reaches 90° to 110° C, slowly adding 0.2% polyisobutylene having a mean molecular weight higher than 100,000 and 15 to 48% by weight of a polymer of hydrogenated isobutylene, said polymer having a mean molecular weight of between 300 and 2500 when the temperature reaches 150° to 180° C, and maintaining such temperature during the addition of the polymer,

cooling the mixture and homogenizing said mixture at 10° to 35° C.

4,075,113
GREASE COMPOSITION

Guy Camille Van Doorne, Zellik, Belgium, assignor to Labofina S.A., Brussels, Belgium

Continuation-in-part of Ser. No. 544,688, Jan. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 327,787, Jan. 29, 1973, abandoned. This application June 25, 1976, Ser. No. 699,854

Int. Cl.[2] C10M *1/24, 3/18, 5/14, 7/20*

U.S. Cl. 252—35 **8 Claims**

1. A lubricating grease composition consisting essentially of 2 to 8% by weight of an aluminum fatty acid soap, 25 to 98% by weight of non-hydrogenated polyisobutylene having a mean molecular weight ranging from 300 to 2500, 2 to 58% mineral lubricating oil, and 0.2% polysobutylene having a mean molecular weight higher than 100,000, and also having a worked penetration in the range of about 285 to 340 and a wear index in the range of about 0.63 to 0.74.

5. A process for the manufacture of lubricating greases which comprise:

dispersing, at 15°–50° C 2 to 8% by weight, based on the total composition, of aluminum fatty acid soap, into 10 to 50% by weight of a non-hydrogenated polymer of polyisobutylene said polymer having a mean molecular weight of between 300 and 2500,

progressively heating said dispersion,

adding 2 to 58% by weight of mineral lubricating oil when the temperature reaches 90° to 110° C,

slowly adding 0.2% polyisobutylene having a mean molecular weight higher than 100,000 and 15 to 48% by weight of a polymer of non-hydrogenated isobutylene, said polymer having a mean molecular weight of between 300 and 2500 when the temperature reaches 150° to 180° C, and maintaining such temperature during the addition of the polymer,

cooling the mixture and homogenizing said mixture at 10 to 35° C.

4,075,114
FLEXIBLE GRAPHITE MATERIAL CONTAINING BORIC ACID

Toshikatsu Ishikawa, Tokyo; Tanaka Junichi, Yokohama; Haruo Teranishi, Machida, and Shinichiro Kondo, Yokohama, all of Japan, assignors to Nippon Carbon Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1976, Ser. No. 666,390

Claims priority, application Japan, Mar. 24, 1975, 50-35176

Int. Cl.[2] C01B *31/04;* **C04B** *35/54;* **B29G** *1/00*

U.S. Cl. 252—62 **5 Claims**

1. A process for producing flexible graphite material comprising incorporating expanded graphite material with boric acid in amounts of 3–15 % by weight thereof, and compression molding the mixture.

2. A process according to claim 1, wherein the compression molding is effected at 80–250 kg/cm^2.

4,075,115
SILICONE FLUID USEFUL AS A BRAKE FLUID

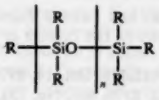
Edgar D. Brown, Jr., Schenectady, and Frank J. Traver, Troy, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Division of Ser. No. 290,075, Sept. 18, 1972, abandoned. This application June 11, 1973, Ser. No. 368,816

Int. Cl.[2] C09K *5/00*

U.S. Cl. 252—75 **8 Claims**

1. A process for transmitting force through a brake hydraulic system having hydraulic activating means, hydraulic activated means and hydraulic line means connecting said hydraulic activating means with said hydraulic activated means comprising applying mechanical force to said activating means wherein said hydraulic activating means, said hydraulic activated means and said hydraulic lines are substantially fluid with a linear polymer silicone hydraulic fluid of the formula,



where n varies from 1 to 2000, R is selected from the class consisting of monovalent hydrocarbon radicals, halogenated monovalent hydrocarbon radicals and cyanoalkyl radicals and the viscosity of said fluid varies from 20 to 500 centistokes at 25° C, and from 1 to 20% by weight of the total fluid of glycol water tolerance additive which has the formula,

$$HO—R^1—OH$$

where R^1 is selected from the class consisting of alkylene and arylene radicals of 2 to 12 carbon atoms.

4,075,116
MIXED PERSALTS STABLE IN DETERGENT COMPOSITIONS

Louis Mesaros, Oullins, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Aug. 11, 1976, Ser. No. 713,430

Claims priority, application France, Sept. 15, 1975, 75 28193

Int. Cl.[2] C11D *7/56, 7/60*

U.S. Cl. 252—102 **9 Claims**

1. A process for the preparation of sodium chloride-free mixed persalts capable of liberating hydrogen peroxide in aqueous solution and stable in dry alkaline mixtures, which process comprises adding aqueous hydrogen peroxide containing from 60 to 80% H_2O_2 and 0.6 to 1.8 percent, based upon 100 percent H_2O_2, of ethylenediaminetetraacetic acid at a temperature of from 20° to 60° C to sodium carbonate monohydrate or a hydrated sodium carbonate containing from 75 to 90% Na_2CO_3, and adding at least one alkali metal stabilizing compound chosen from the group consisting of sodium sulfate, potassium sulfate, sodium pyrophosphate, potassium pyrophosphate, sodium metasilicate, sodium disilicate, sodium citrate, sodium glucoheptonate, sodium perborate, anhydrous sodium carbonate, potassium carbonate, and mixed sodium and potassium carbonate.

4,075,117
BUILT DETERGENT COMPOSITIONS

Edgar J. Morton, Brantford; Harold Donnan, Waterford, both of Canada, and Arnold Wiesenfeld, Wyckoff, N.J., assignors to Witco Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 410,648, Oct. 15, 1973, abandoned, which is a continuation of Ser. No. 140,556, May 5, 1971, abandoned. This application Sept. 15, 1976, Ser. No. 723,511

Int. Cl.[2] C11D *1/12*

U.S. Cl. 252—135 **6 Claims**

1. An improved built dry powder laundry detergent composition in the form of spray dried beads consisting essentially of the following ingredients in the following ranges of percentages by weight:

(a) from 15 to 20% of a sodium linear alkyl benzene sulfonate detergent;

(b) about 12% amorphous water-soluble sodium silicate having an $Na_2O:SiO_2$ ratio between about 1:2 and 1:3;

(c) from 25 to 35% of a member selected from the group consisting of sodium carbonate, sodium bicarbonate, sodium sesquicarbonate and mixtures of same; and

(d) from 25 to 45% sodium sulfate.

4,075,118

LIQUID DETERGENT COMPOSITIONS CONTAINING A SELF-EMULSIFIED SILICONE SUDS CONTROLLING AGENT

Terrell Wilson Gault, Seattle, Wash., and Edward John Maguire, Jr., Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 622,305, Oct. 14, 1975, abandoned. This application Oct. 12, 1976, Ser. No. 731,256
Int. Cl.[2] C11D *3/37;* B01D *19/04;* C11D *3/20*
U.S. Cl. 252—135 20 Claims

1. A concentrated, essentially homogeneous, low-sudsing liquid detergent composition comprising:

(a) from about 10% to about 50% by weight of a non-ionic surfactant;

(b) from about 10% to about 50% by weight of an anionic surfactant, the total amount of surfactant being more than about 30% and the ratio of nonionic surfactant to anionic surfactant being within the range of from about 1:8 to about 8:1 based on the free acid form of the anionic surfactant; and

(c) an effective amount of self-emulsifiable silicone suds controlling agent comprising a silicone suds controlling agent and an emulsifier for said silicone suds controlling agent.

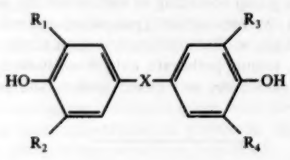
4,075,119

STATISTICAL MIXTURES OF HALOGENATED BISPHENOLS WITH HALOGEN-FREE BISPHENOLS

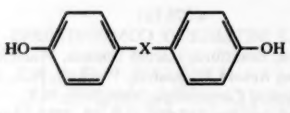
Manfred Schmidt; Dieter Freitag, and Werner Nouvertné, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 21, 1976, Ser. No. 678,807
Claims priority, application Germany, May 7, 1975, 2520317; Dec. 17, 1975, 2556739; May 7, 1975, 2520316
Int. Cl.[2] C07C *39/00, 39/24;* C08G *63/12*
U.S. Cl. 252—182 8 Claims

1. Statistical mixtures comprising halogen-free bisphenols of the formula II with mono-, di-, tri- and tetra -halogenated bisphenols, wherein the halogen is selected from the group consisting of bromine and chlorine, of the formula I



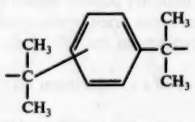
I



II

wherein

X denotes C_1 - C_9 alkylene, C_2 - C_9 alkylidene, C_5 - C_{15} cycloalkylene, C_5 - C_{15} cycloalkylidene, a single bond, —O—, —S—, —SO—, —SO_2—, —CO— or



R_1 to R_4 are identical or different and denote H, Br or Cl, and at least one R is Br or Cl

wherein the total halogen content of the statistical mixtures is about 3 to 48% by weight and they contain about 0 - 48% by weight of bromine alone, about 0 - 30% by weight of chlorine alone or bromine and chlorine conjointly in any desired ratios by weight.

4,075,120

LASER PHOSPHATE GLASS COMPOSITIONS

John D. Myers, Toledo, Ohio, and Charles S. Vollers, Blissfield, Mich., assignors to Kogre, Inc., Toledo, Ohio

Filed May 14, 1975, Ser. No. 577,331
Int. Cl.[2] C03C *3/16;* C09K *11/42, 11/46*
U.S. Cl. 252—301.4 P 12 Claims

1. A laser glass comprising the following ingredients in mole percentages:

Ingredient	Mole Percent
P_2O_5	35 to 65
R_2O_3	0.01 to 15
RO	5 to 30
R_2O	5 to 40
Nd_2O_3	0.01 to 7

wherein R_2O_3 is selected from the group consisting of Al_2O_3, La_2O_3, Y_2O_3, Tm_2O_3, B_2O_3, Er_2O_3 and mixtures thereof, wherein RO is selected from the alkaline earth oxide group consisting of BaO, BeO, MgO, SrO, CaO and mixtures thereof, wherein R_2O is selected from the alkali metal oxide group consisting of Li_2O, K_2O, Na_2O, Rb_2O, and mixtures thereof and wherein a solarization inhibiting oxide is present in an amount sufficient to prevent discoloration, and wherein said solarization inhibiting oxide is selected from the group consisting of TiO_2, Sb_2O_3, CeO_2, SiO_2 and mixtures thereof.

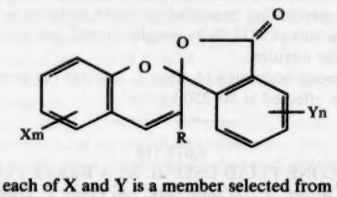
4,075,121

WOOD PRESERVATIVES AND METHOD FOR WOOD PRESERVATION TREATMENT

Kazuhiko Konno; Yosio Hayasi; Eiji Taniyama, and Tetsuo Sekiya, all of Amimachi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Feb. 27, 1976, Ser. No. 662,084
Claims priority, application Japan, Mar. 3, 1976, 51-25047
Int. Cl.[2] C09K *15/22*
U.S. Cl. 252—407 5 Claims

1. A method for preservation treatment of wood which comprises treating wood or wood inhabited by wood-decaying microorganisms with 2H-benzopyran-2-spiro-3'-phthalide or its derivative of the following formula



wherein each of X and Y is a member selected from the group consisting of halogen atoms, a nitro group, an amino group, alkyl groups, alkenyl groups, alkoxy groups, alkylthio groups and alkyl-substituted amino groups; m and n are an integer of 0 to 4, and when m is an integer of 2 to 4 and n is an integer of 2 to 4, a plurality of members X and Y may be identical or different; R is a member selected from the group consisting of a hydrogen atom, alkyl groups and a phenyl group; and each of X and Y may be positioned at two adjacent carbon atoms on the benzene ring and may form another benzene ring together with these carbon atoms,

in an amount effective for controlling said wood-decaying microorganisms.

4,075,122

CATALYST AND METHOD OF OXYDEHYDROGENATION OF ALKYL AROMATIC COMPOUNDS

G. Edwin Vrieland, Midland, Mich., and Hans R. Friedli, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 474,124, May 28, 1974, Pat. No. 3,917,732. This application Oct. 1, 1975, Ser. No. 618,730

Int. Cl.[2] B01J *27/16*

U.S. Cl. 252—437 2 Claims

1. A catalyst for oxydehydrogenation of alkyl aromatic compounds consisting essentially of a magnesium pyrophosphate in which the ratio of magnesium to nickel is about 6 to about 9.5 atoms of magnesium per atom of nickel which has been calcined at about 550° C.

4,075,123

PROCESS FOR THE PREPARATION OF UNSATURATED ACIDS FROM UNSATURATED ALDEHYDES

James F. White, Akron; Wilfrid G. Shaw, Lyndhurst, and Michael D. Applequist, Mayfield Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 19, 1976, Ser. No. 733,737

Int. Cl.[2] B01J *27/14*; C07C *51/24*

U.S. Cl. 252—437 17 Claims

1. The catalyst composition described by the formula

$$X_aY_bMo_{12}P_cAs_dO_x$$

wherein

X is a rare earth element or a mixture thereof;

Y is at least one of Ag, Tl, Rh, Pd, Ru, Pt, Cd, Al, Au, Cu, alkaline earth metal, Cl, and NH_4;

wherein

a is 0.001 to 10;

b is 0 to 10;

c is 0.01 to 5;

d is 0.01 to 5;

x is the number of oxygens required to satisfy the valence states of the other elements present.

4,075,124

PROCESS FOR THE PREPARATION OF UNSATURATED ACIDS FROM UNSATURATED ALDEHYDES

James F. White, Akron; Wilfrid G. Shaw, Lyndhurst, and Michael D. Applequist, Mayfield Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 19, 1976, Ser. No. 733,738

Int. Cl.[2] B01J *27/14*; C07C *51/24*

U.S. Cl. 252—437 14 Claims

1. The catalyst composition described by the formula

$$X_aX_bMo_{12}P_cAs_dO_x$$

wherein

X is at least one element selected from the group consisting of Ag, Rh, Au and Ru;

Y is at least one of Cd, Tl, Pd, Al, Ge, Cu, Pt, Ni, alkaline earth metal, NH_4 and Cl;

and wherein

a is 0.001 to 10;

b is 0 to 10;

c is 0.01 to 5;

d is 0.01 to 5;

x is the number of oxygens required to satisfy the valence states of the other elements present.

4,075,125

CATALYSTS FOR HYDRODEMETALLIZATION OF HYDROCARBONS CONTAINING METALLIC COMPOUNDS AS IMPURITIES

Tatsuo Morimoto, Yokohama; Munekazu Nakamura, Kamakura; Masayoshi Inooka, and Teizaburo Yawata, both of Yokohama, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Filed July 9, 1976, Ser. No. 704,020

Claims priority, application Japan, July 9, 1975, 50-83580; Sept. 25, 1975, 50-114807; Sept. 25, 1975, 50-114808; Sept. 25, 1975, 50-114809

Int. Cl.[2] B01J *29/06, 23/08*

U.S. Cl. 252—455 R 2 Claims

1. A catalyst for hydrodemetallization of hydrocarbons containing metallic compounds as impurities, said catalyst having been prepared by a process wherein red mud is admixed with alumina or/and an alumina-containing substance in a amount of from 1 to 10% by weight based on the weight of the red mud, shaped and calcined at a temperature of 600° C to 1,100° C.

2. A catalyst in accordance with Claim 1 in which an organic binder together with said alumina or/and said alumina-containing substance is admixed with said red mud.

4,075,126

CATALYST FOR ALKYLATING AROMATIC HYDROCARBONS

George E. Stridde, Houston, Tex., assignor to N L Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 671,507, March 29, 1976, Pat. No. 3,992,467, which is a division of Ser. No. 503,985, Sept. 6, 1974, Pat. No. 3,965,043. This application Nov. 5, 1976, Ser. No. 739,331

The portion of the term of this patent subsequent to June 22, 1993, has been disclaimed.

Int. Cl.[2] B01J *29/06, 29/00*

U.S. Cl. 252—455 R 30 Claims

1. A catalyst comprising a synthetic trioctahedral 2:1 layer-lattice smectite-type clay mineral containing a metallic cation having a Pauling electronegativity greater than 1.0 in cation exchange positions on the surface of said mineral, said mineral having the structural formula:

$$[(aM^{+1}+bM^{+2}+cM^{+3})^{VI}(dD^{+3}+eD^{+4}+fD^{+5})^{IV}O_{20}(OH)_{4-y}F_y](x/z)\ R^z$$

where

$11 \leqq a+2\,b+3c \leqq 12.3$

$31 \leqq 3d+4e+5f \leqq 32$

$43 \leqq a+2b+3c+3d+4e+5f \leqq 43.67$

$x = 44-(a+2b+3c+3d+4e+5f)$

$0 \leqq y \leqq 4$

$0 \leqq a \leqq 1$

$5 \leqq b \leqq 6$

$0 \leqq c \leqq 0.3$

$0 \leqq d \leqq 1$

$7 \leqq e \leqq 8$

$0 \leqq f \leqq 0.4$

provided that when a=0, then either: (1) $f>0$; or (2) $c>0$ and M^{+3} and D^{+3} are not Al^{+3} when M^{+2} is 100 mole percent Mg^{+2}, and where the cations M are in the octahedral layer and have an ionic radius not greater than 0.75 A, the cations D are in the two outer tetrahedral layers and have an ionic radius not greater than 0.64 A, and R is at least one of said metallic cations having a Pauling electronegativity greater than 1.0 of valence z

6. The catalyst of claim 1 wherein said R is selected from the group consisting of Al^{3+}, Cr^{3+}, Ga^{3+}, In^{3+}, Mn^{2+}, Fe^{3+}, Co^{3+}, Co^{2+}, Ni^{2+}, Cu^{2+}, Ag^{+}, Be^{2+}, Mg^{2+}, La^{3+}, Ce^{3+}, Pd^{2+}, Pt^{2+}, and mixtures thereof.

16. The catalyst of claim 1 wherein M is selected from the group consisting of Li^{+}, Mg^{2+}, Ni^{2+}, Co^{2+}, Zn^{2+}, Cu^{2+}, Mn^{2+}, Al^{3+}, Cr^{+3}, and mixtures thereof, and D is selected

from the group consisting of Al^{3+}, Cr^{3+}, Fe^{3+}, Si^{+4}, Ge^{+4}, P^{+5}, V^{+5}, and mixtures thereof.

4,075,127

CATALYST FOR PRODUCTION OF α,β-UNSATURATED CARBOXYLIC ACIDS

Koju Kadowaki; Kenji Takagi, and Yoshiaki Tanaka, all of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Filed Aug. 11, 1976, Ser. No. 713,593
Claims priority, application Japan, Aug. 18, 1975, 50-99890
Int. Cl.[2] B01J *23/84, 23/88*
U.S. Cl. 252—470 **7 Claims**

1. A catalyst for production of an α,β-unsaturated aliphatic carboxylic acid by the vapour phase oxidation of the corresponding α,β-unsaturated aliphatic aldehyde, which consists essentially of an activated catalytic oxide complex of antimony, nickel, molybdenum, vanadium, tungsten, niobium, copper and oxygen and defined by the following formula:

$$Sb_a Ni_b Mo_c V_d W_e Nb_f Cu_g O_h$$

wherein, $a = 100$, $b = 15 - 150$, $c = 10 - 500$, $d = 5 - 150$, $e = 0 - 100$, $f = 0 - 100$, $g = 0 - 50$ wherein g is not 0, when $f = 0$ and $h \leqq 2950$, which is a number determined by the valence requirements of the other elements present respectively, in atomic ratio.

4,075,128

PREPARATION OF METHYL ETHYL KETONE

Thomas Stephen Zak, Springfield, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 26, 1976, Ser. No. 745,504
Int. Cl.[2] B01J *23/16;* C07C *45/00*
U.S. Cl. 252—475 **2 Claims**

1. In the method of preparing methyl ethyl ketone by directing the vapors of secondary butyl alcohol through a catalytic dehydrogenation zone, the improvement which consists essentially of employing in said process a catalyst formed by:

preparing a brass powder having more than 50% of the particles having a particle size less than about 44 microns, less than 1% having a particle size larger than 250 microns, and the balance of the particles having a particle size from about 44 to about 250 microns,

compressing said brass powder into pellets each pellet having a density between about 5 and 6 grams per cubic centimeter,

heat treating a bed of pellets at conditions corresponding to treatment at about 950° F., ±50° F. for about one hour to provide activated pellets having a pore volume within a range from about 0.038 to about 0.046 cc per gram,

employing said activated pellets for said dehydrogenation of secondary butyl alcohol said dihydrogenation being at a pressure of from about 100 to about 150 psig at a temperature of from about 700° F. to about 750° F. at a liquid hourly space rate of about one.

4,075,129

DETERGENT COMPOSITION

Moriyasu Murata, Chiba; Makoto Yamanaka, Koganei, and Takashi Fujino, Yokohama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,912
Claims priority, application Japan, Mar. 20, 1975, 50-33646
Int. Cl.[2] C11D *1/14, 3/08*
U.S. Cl. 252—527 **6 Claims**

1. A detergent composition consisting essentially of from 0.5 to 60 percent by weight of ether sulfate surfactant consisting of

(A) from 30 to 65 percent by weight of unbranched-alkyl ether sulfate having the formula

$$R_1—O—(CH_2CH_2O)_nSO_3M$$

and (B) the balance is branched-alkyl ether sulfate having the formula

$$R_2—\underset{\displaystyle R_3}{\underset{|}{CH}}—CH_2—O—(CH_2CH_2O)_nSO_3M \qquad (II)$$

wherein R_1 is unbranched alkyl having a carbon atom number range of from 6 to 15 and wherein the average number of carbon atoms in R_1 of (A) in the range of from 8 to 13, R_2 is unbranched alkyl having a carbon atom number range of from one to 12, R_3 is unbranched alkyl having a carbon atom number range of from one to 4, with the proviso that

$$R_2—\underset{\displaystyle R_3}{\underset{|}{CH}}—CH_2—$$

has an average numer of carbon atoms in the range of from 8 to 13, n is a number from 0.5 to 1.5 as an average for (A) and (B), and M is a water-solubilizing cation selected from the group consisting of alkali metals, alkaline earth metals and alkanol amines;

and the balance of said detergent composition is water-soluble, anionic surfactant with the proviso that said anionic surfactant is not an ether sulfate, or water-soluble, synthetic, nonionic surfactant, or water-soluble, synthetic, amphoteric surfactant, or water-soluble alkaline or neutral inorganic builder salt, or water-soluble organic heavy metal-sequestering agents, or solubilizing agents, or water, or mixtures thereof.

4,075,130

POLYOXYPROPYLENE POLYAMINE DERIVATIVES AS DEFOAMERS

Carter G. Naylor, and Ernest L. Yeakey, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,490
Int. Cl.[2] C11D *1/10, 1/48, 3/30*
U.S. Cl. 252—548 **18 Claims**

1. A composition useful as a defoamer and foam inhibitor consisting essentially of the reaction product obtained by alkoxylating a polyoxypropylene polyamine having a molecular weight of 190–3000 and selected from the group consisting of a polyoxypropylene diamine of the formula:

$$H_2NCH(CH_3)—CH_2O—[CH(CH_3)—CH_2O]_x—CH_2—CH(CH_3)—NH_2$$

wherein x is an integer of from about 1 to 40, and a polyoxypropylene triamine of the formula:

$$\begin{array}{l} CH_2—[OCH_2CH(CH_3)]_x\,NH_2 \\ | \\ CH_3CH_2C—CH_2—[OCH_2CH(CH_3)]_y\,NH_2 \\ | \\ CH_2—[OCH_2CH(CH_3)]_z\,NH_2 \end{array}$$

where x, y and z represent integers in the range of about 1 to 15, and the sum of x, y and z is from 3 to about 50, said alkoxylation being carried out with ethylene oxide and a higher alkylene oxide of three carbons or more in a manner such that said defoamer composition has a cloud point of 10°–60° by first alkoxylating said polyoxypropylene polyamine with ethylene oxide or a mixture of ethylene oxide and said higher alkylene oxide wherein said ethylene oxide predominates in said mixture, and effecting a final alkoxylation with said higher alkylene oxide or a mixture of ethylene oxide and said higher alkylene oxide wherein said higher alkylene oxide predominates.

16. A detergent composition comprising an alkaline inorganic detergent and a synthetic organic detergent selected

from the group consisting of an alkyl aryl sulfonate, an alkyl sulfonate, an alkanol amide, an alkyl aryl polyether and mixtures thereof having also incorporated therein in a minor amount the composition of claim 1.

4,075,131

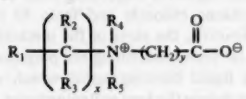
CONDITIONING SHAMPOO

Craig A. Sterling, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 17, 1976, Ser. No. 724,111
Int. Cl.[2] C11D *1/02, 3/26;* A61K *7/06*
U.S. Cl. 252—542 13 Claims

1. A conditioning shampoo composition which consists essentially of from about 1% to about 60% by weight anionic or amphoteric surfactant and at least about 0.5% by weight zwitterionic polymer, said polymer containing at least 10% on a molar basis of zwitterionic moiety, having a viscosity of about 100 to 100,000 cps, when tested at 24.5 ± 0.25% nonvolatiles in water (with a Brookfield viscometer, using the appropriate spindle and speed) and being selected from a group consisting of

(A) polymers of carboxy betaines having the repeating formula



wherein, R_1 represents a polymerizable unsaturated group, x and y represent integers from 1 to 3 inclusive, R_2 and R_3 represent hydrogen, methyl, ethyl or propyl radicals, R_4 and R_5 represent a hydrogen atom or an alkyl radical with the total carbon atoms in R_4 and R_5 not exceeding six, and

(B) copolymers of monomers (1) and (2), shown below:

(1) substituted acidic vinyl compounds having the general formula $CR_7H{=}CR_8CO_2H$ wherein R_7 represents a hydrogen atom or a carboxylic acid group and R_8 represents a hydrogen atom, a chlorine atom or a methyl group, and

(2) substituted basic vinyl compounds having the general formula $CH_2{=}CR_6COQ$ wherein R_6 represents a hydrogen atom or a methyl group and Q is an organic radical containing a basic nitrogen-containing group, wherein the mole ratio of basic monomer to acidic monomer in said copolymer is from 0.6:1 to 1.5:1, except where R_7 is CO_2H, the mole ratio is 1.2:1 to 3:1.

4,075,132

METHOD OF PREPARING β-DIHYDROTHEBAINE

David Edward Portlock, Woburn, Mass., assignor to Sharp Associates, Cambridge, Mass.

Division of Ser. No. 624,666, Oct. 22, 1975, Pat. No. 4,025,521.
This application Dec. 23, 1976, Ser. No. 757,460
Int. Cl.[2] C07D *221/28*
U.S. Cl. 260—285 2 Claims

1. A method of producing β-dihydrothebaine, which method comprises:

the step of isomerizing dihydrothebaine-ϕ to β-dihydrothebaine with 3–5 equivalents of potassium in liquid ammonia with a ferric-ion catalyst.

4,075,133

ACIDIC COPOLYMERS BASED ON GLYCIDYL ALLYL POLYETHERS ADAPTED FOR ANIONIC ELECTRODEPOSITION

Kazys Sekmakas, Chicago, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Aug. 2, 1976, Ser. No. 710,601
Int. Cl.[2] C08L *61/10, 61/28*
U.S. Cl. 260—29.3 15 Claims

1. An aqueous electrocoating bath comprising water having dispersed therein from 2–20% by weight of resin solids consisting essentially of:

(A) from 60–95%, based on total resin, of a carboxyl-functional copolymer of:

(1) from 5–75% of the copolymer of a polyethylenic polyether containing from about 1.2 to about 2.0 ethylenically unsaturated groups per molecule, said polyethylenic polyether being formed by reacting a polyepoxide which is a polyglycidyl ether of a bisphenol having a 1,2-epoxy equivalency of from 1.2 to about 2.0 with about one mole of a bisphenol per epoxy equivalent in said polyepoxide to consume the epoxy functionality by reaction with the phenolic OH group in said bisphenol and provide an intermediate carrying phenolic OH terminal groups, and then reacting phenolic OH terminal groups in said intermediate with the epoxy group in a molar excess of an ethylenically unsaturated monoepoxide;

(2) the balance of the copolymer consisting essentially of copolymerizable monoethylenically unsaturated monomers including carboxy-functional monomer, said copolymer having an acid number in the range of about 12 to about 100 and being dispersed in said aqueous bath with the aid of a base and water miscible organic solvent; and

(B) from 5–40%, based on total resin, of a heat-hardening formaldehyde condensate selected from the group of aminoplast resins and water dispersible phenolic resins; said bath having a pH in the range of 8–10 and a conductivity of less than 1800.

4,075,134

EMULSION POLYMERIZATION METHOD FOR PREPARING MICROSPHERES HAVING LIQUID CENTER AND SEAMLESS RIGID WALLS

Donald S. Morehouse, Jr., Midland, Mich.; Frank H. Bolton, deceased, late of Midland, Mich., and by Kathryn M. Bolton, administratrix, Grand Rapids, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 44,592, June 8, 1970, which is a continuation-in-part of Ser. No. 805,908, March 10, 1969, abandoned. This application Sept. 27, 1973, Ser. No. 401,474
Int. Cl.[2] C08L *25/04*
U.S. Cl. 260—29.6 RW 20 Claims

1. An emulsion polymerization method for preparing microspheres having liquid centers and seamless rigid walls of a normally solid, organic polymer, said method comprising (1) admixing a water-insoluble, non-polymerizable, substantially inert liquid with a total monomer of at least one emulsion polymerizable, ethylenically unsaturated monomer, said liquid being soluble in the monomer and insoluble in said organic polymer and being present in amount sufficient to constitute from about 33 to about 55 volume percent of the total of monomers, non-polymerizable liquid and aqueous medium but less than 50 volume percent of the total of monomer and non-polymerizable liquid, said total monomer being capable of polymerization to form a water-insoluble polymer; (2) dispersing the resulting mixture in an aqueous medium containing from about 0.5 to about 4 weight percent based on total monomer of a stabilizing emulsifier and from about 0.2 to about 2 weight percent based on total monomer of an at least inherently water-dispersible polymer of a sulfohydrocarbyl ester of an α,β-ethylenically unsaturated carboxylic acid, said polymer

containing at least one milliequivalent of sulfo groups per gram of polymer; and (3) subjecting the dispersion to emulsion polymerization conditions whereby the polymer of the sulfohydrocarbyl ester acts as a coalescing aid and the total monomer polymerizes to form microspheres of a water-insoluble polymer encapsulating said non-polymerizable liquid.

4,075,135

METHOD AND RESINOUS VEHICLES FOR ELECTRODEPOSITION

Edward L. Jozwiak, Jr., Gibsonia, and Suryya K. Das, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 28, 1975, Ser. No. 599,746
Int. Cl.[2] C08L 9/10
U.S. Cl. 260—29.7 DP **7 Claims**

1. A process for preparing a resinous vehicle suitable for electrodeposition which comprises:

A. addition polymerizing a material having $CH_2{=}C<$ moieties, in the presence of an oil-soluble free radical polymerization catalyst and a chain transfer agent, in aqueous medium with

B. an at least 30 percent neutralized reaction product of:

1. an alpha, beta-ethylenically unsaturated dicarboxylic acid or its anhydride containing from 4 to 12 carbon atoms, and

2. polybutadiene which is a liquid at room temperature and which has a molecular weight of 700–5000.

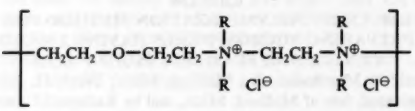
4,075,136

FUNCTIONAL IONENE COMPOSITIONS AND THEIR USE

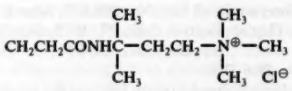
Raymond Joseph Schaper, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 436,419, Jan. 25, 1974, abandoned. This application Apr. 14, 1976, Ser. No. 676,777
Int. Cl.[2] C07D 211/00
U.S. Cl. 260—2 R **3 Claims**

3. A polymer composition having recurring units represented by the formula:



wherein R is



4,075,137

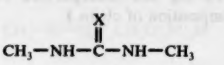
PROCESS FOR PREPARING FLAME RETARDING POLYURETHANE FOAMS

Yasumasa Sawachika, Ashikaga; Hiroshi Kawakami, Tanuma, and Shuzo Minegishi, Tokyo, all of Japan, assignors to Kohkoku Chemical Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 621,673, Oct. 14, 1975, abandoned, which is a continuation of Ser. No. 460,077, April 1, 1974, abandoned. This application Apr. 30, 1976, Ser. No. 682,351
Claims priority, application Japan, Apr. 19, 1973, 48-44468
Int. Cl.[2] C08G 18/14, 18/78
U.S. Cl. 260—2.5 AT **8 Claims**

1. A process for preparing flexible and flame retarding polyurethane foams, comprising adding

A. a diisocyanate mixture which contains about 10 to 60% by weight of a divalent biuret diisocyanate obtained by reacting one mole of a compound having the formula of



wherein X is oxygen or sulfur with about 3.6 to 25.6 moles of an organic diisocyanate at a temperature below 150° C to

B. a mixture of polyhydroxyl compound having at least two active hydrogen atoms and a molecular weight between about 1000 and 10,000, at least 10% by weight of the total hydroxyl group being primary hydroxyl, a blowing agent, and a catalyst.

4,075,138

POLYMERIZATION PROCESS AND VINYLIDENE CHLORIDE MICROSPHERES PRODUCED THEREBY

Joseph L. Garner, Sanford, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 649,884, Jan. 16, 1976, abandoned, which is a continuation of Ser. No. 270,296, July 10, 1972, abandoned. This application May 3, 1977, Ser. No. 793,332
Int. Cl.[2] C08J 9/16, 9/18
U.S. Cl. 260—2.5 B **6 Claims**

1. In a method for the preparation of synthetic resinous thermoplastic microspheres employing from 60 to 90 parts by weight of vinylidene chloride and from 40 to 10 parts by weight of acrylonitrile, the steps of the method comprising

preparing an oil phase containing the polymerizable component and a liquid blowing agent which volatilizes at a temperature below the heat softening point of the polymer prepared from the monomer mixture,

dispersing the oil phase in the water phase, the water phase containing a dispersion stabilizer, the oil phase being dispersed as a plurality of droplets having diameters from about 1 to about 50 microns,

initiating polymerization of the monomer in the droplets to form a plurality of hollow polymer particles having symmetrically encapsulated therein a volatile fluid foaming agent, the improvement which comprises

employing from about 3 to 12 parts by weight of a copolymerizable monomer having a propagation constant of from about 2 to about 15,000 liters per mole second and $(r_1/r_2) > 1$ wherein r_1 is the reactivity ratio for the copolymerizable monomer and r_2 is the reactivity ratio for acrylonitrile, with the further limitation that the vinylidene chloride/acrylonitrile/volatile fluid foaming agent and the copolymerizable monomer are mutually soluble at a temperature between about 20° to 90° C and the copolymerizable monomer being selected from the group consisting of methacrylonitrile, methylmethacrylate, styrene, 1,3-butadiene and mixtures thereof.

4,075,139

PROCESS OF MAKING A CURED RESOLE FOAM AND PRODUCT PRODUCED THEREFROM

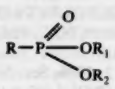
Richard L. Greer, Hermosa Beach, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 22, 1977, Ser. No. 770,286
Int. Cl.[2] C08J 9/14
U.S. Cl. 260—2.5 F **11 Claims**

1. In a process for the preparation of a phenolic foam by the reaction of a phenol-aldehyde resole resin, a blowing agent and an acidic catalyst, the improvement which comprises employing a premixed catalyst combination comprising:

(a) an aromatic sulfonic acid; and

(b) a phosphonate compound having the formula



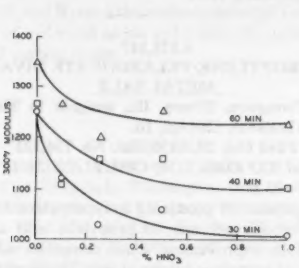
wherein R, R_1 and R_2 are each independently selected from the class consisting of alkyl having from 1 to 8 carbon atoms, inclusive, aryl having from 6 to 12 carbon atoms inclusive, and aralkyl having from 7 to 13 carbon atoms inclusive and wherein the proportion in parts by weight of said phosphonate compound to said aromatic sulfonic acid is from about 5:1 to 1:5, and said premixed catalyst combination is employed in the range of about 3 parts to about 30 parts per 100 parts of said resole resin.

4,075,140

OXIDIZING CARBON BLACK AND USE OF IT IN ELASTOMERS

Harold R. Hunt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 19, 1976, Ser. No. 678,098
Int. Cl.² C08K 3/04; C09C 1/56
U.S. Cl. 260—5 **5 Claims**



1. A process to produce oxidized carbon black which comprises contacting said carbon black with an aqueous nitric acid having a concentration of about 0.05 to about 1 weight % with the weight ratio of HNO_3 to carbon black being in the range of about 5×10^{-4} to about 1×10^{-2} and drying the thus treated carbon black at a temperature in the range of about 400° to about 550° F.

3. A process for treating carbon black so as to adjust and control the modulus and/or scorch time of a rubber composition containing said carbon black which comprises

a. compounding a sample of said carbon black and a rubber into a rubber composition,

b. determining the modulus and/or scorch time of said rubber composition,

c. comparing said determined modulus and/or said determined scorch time with a preselected upper limit for the modulus and/or a preselected lower limit for the scorch time,

d. if said determined modulus is above said upper limit for the modulus, and/or if said determined scorch time is below said lower limit for the scorch time oxidizing the carbon black by

aa. contacting said carbon black with an aqueous nitric acid having a concentration of about 0.05 to about 1 weight % at a weight ratio of HNO_3 to carbon black in the range of about 5×10^{-4} to 1×10^{-2}, and

bb. drying the thus treated carbon black at temperatures in the range of about 400° F to about 550° F.

4,075,141

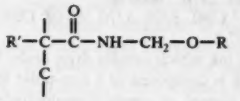
CARBOXYLIC ACID AMIDE INTERPOLYMER-BASED COATING COMPOSITIONS

Samuel Porter, Jr., Tarentum, and Bruce N. McBane, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 9, 1975, Ser. No. 621,109
Int. Cl.² C08L 5/00
U.S. Cl. 260—17.2 **27 Claims**

1. In a coating composition comprising a solution or dispersion of an interpolymer consisting essentially of the interpolymerization product of:

A. from about 2.5 percent to about 50 percent of an unsaturated carboxylic acid amide in units of the structure:



wherein R′ is hydrogen or lower alkyl and R is hydrogen or lower alkyl with at least 50 percent of the groups represented by R being lower alkyl;

B. from about 1 percent to about 25 percent of an alpha, beta-ethylenically unsaturated carboxylic acid; and

C. at least one other copolymerizable ethylenically unsaturated monomer containing a $CH_2{=}C<$ group;

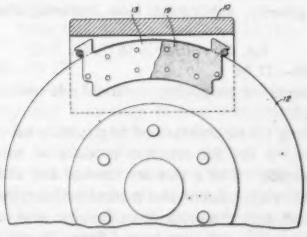
wherein the improvement comprises the addition to said solution or dispersion of from about 2 percent to about 50 percent of by weight crosslinked polymeric microparticles formed by the free radical addition copolymerization of from about 0.5 percent to about 15 percent of an alpha, beta-ethylenically unsaturated monocarboxylic acid, at least one other copolymerizable ethylenically unsaturated monomer, and from about 0.5 percent to about 15 percent of a crosslinking monomer selected from the group consisting of epoxy group-containing compounds, alkylenimines, organoalkoxysilanes and mixtures thereof in the presence of a dispersing liquid which is a solvent for the polymerizable monomers but a non-solvent for the resultant polymer, and a dispersion stabilizer containing at least two segments of which one segment is solvated by said dispersing liquid and a second segment is of different polarity than said first segment and is relatively insoluble in said dispersing liquid.

4,075,142

COMPOSITION FOR NON-SQUEAL DISC BRAKE PADS

Norman Bernard Morse, 56 Pratt Drive, Newton, Mass. 02165, and David Bruce Lester, 22 Gray St., Arlington, Mass. 02174

Division of Ser. No. 644,847, Dec. 29, 1975, Pat. No. 3,998,301. This application Aug. 27, 1976, Ser. No. 718,127
Int. Cl.² C08L 1/28
U.S. Cl. 260—17 R **3 Claims**



1. A composition for automobile disc brake pads comprising: a major proportion of soft water base polymeric emulsion having a glass transition temperature in the range between about −40° C and about +20° C; an antifreeze comprising

a liquid glycol; and a thickener comprising a hydrofluidic cellulose ether.

4,075,143

RAPID-DRYING PRINTING INK AND A PRINTING PROCESS USING SAME

Ealbertus Willem Schelhaas, Heiloo, Netherlands, and Eduard Johannes Cornelis Marie Blokker, Orry-la-Ville, France, assignors to O & R Inktchemie N.V., Zaandam, Netherlands

Filed Apr. 21, 1976, Ser. No. 678,971

Claims priority, application Netherlands, Apr. 23, 1975, 7504805; Jan. 28, 1976, 7600874

Int. Cl.[2] C08L *3/06, 3/10, 93/04;* **C09D** *11/08*

U.S. Cl. 260—17.2 **20 Claims**

1. A printing ink which rapidly dries under the influence of heat, and which is composed of a non-polar solvent, a binder formed from a phenol- or cresol formaldehyde resin modified with colophony or with colophony and a polyhydric alcohol and a crosslinkable unsaturated polyester, a peroxide catalyst for said polyester present in the amount of 1–6 wt.% of said binder, and a pigment, the weight ratio of the solvent, the resin and the polyester is such that the two latter components are present in dissolved state, but the resin is no longer soluble after the polyester has been crosslinked, and as a result has disappeared from the solution.

4,075,144

OIL BASE PAINTS CONTAINING WATER-SOLUBLE POLYMERS

Alvin J. Frisque, Western Springs, and Paul L. DuBrow, Chicago, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 425,483, Dec. 17, 1973, abandoned. This application Feb. 22, 1977, Ser. No. 770,954

Int. Cl.[2] B63B *1/34;* **C08L** *91/00*

U.S. Cl. 260—22 R **3 Claims**

1. A more tacky oil base paint which contains uniformly dispersed therethroughout from 2 to 50% by weight of a water-in-oil emulsion, which emulsion contains at least 2% by weight of particles ranging in size from 5 millimicrons to 5 millimeters of a water-soluble vinyl addition polymer, said oil base paint being composed of a binder, an organic solvent and optionally a pigment.

4,075,145

PROCESS FOR PRODUCING WATER SOLUBLE RESINS

Rex Hamilton Russell, 16 Bell Street, Hamilton, New Zealand

Filed May 28, 1976, Ser. No. 690,872

Claims priority, application New Zealand, June 6, 1975, 177731

Int. Cl.[2] C09D *3/56, 3/66, 5/02*

U.S. Cl. 260—22 M **10 Claims**

1. A process for producing water-soluble resins comprising the steps of:

(1) reacting (a) an unsaturated triglyceride oil or a mixture thereof, or (b) the reaction product of an unsaturated triglyceride oil or a mixture thereof and at least one of styrene, vinyl-toluene and methylmethacrylate, with maleic acid, maleic anhydride or fumaric acid, and

(2) polyesterifying the product of Step (1) with a mixture of at least one dicarboxylic acid or anhydride thereof and one or more polyols in proportions to give an hydroxy number of 70 to 140 at the theoretical end-point of reaction, until the resultant product is clear and has an acid value of 55 to 80.

4,075,146

STABILIZED POLYOLEFIN COMPOSITIONS

Kornel Dezso Kiss, Yonkers, N.Y., assignor to Dart Industries, Inc., Los Angeles, Calif.

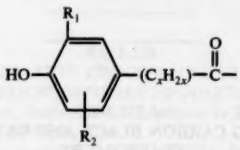
Filed Jan. 2, 1976, Ser. No. 645,982

Int. Cl.[2] C08K *5/09, 5/10, 5/25*

U.S. Cl. 260—23 H **11 Claims**

1. A polyolefin resin composition in direct contact with copper or copper alloys, which composition is stabilized against oxidative degradation with a stabilizer system consisting essentially of:

(a) a stabilizing amount of at least one phenolic antioxidant selected from mono or polyesters of alkane polyols, at least one of such ester groups comprising the acyl moiety



in which R_1 and R_2 independently are a lower alkyl group containing 1 to 5 carbon atoms and x has a value of from 1 to 6, and

(b) at least 100 ppm of calcium stearate based on the weight of the polyolefin resin.

4,075,147

POLYPROPYLENE/PELARGONATE DIVALENT METAL SALT

Donald F. Thompson, Elburn, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 20, 1976, Ser. No. 734,321

Int. Cl.[2] C08K *5/56;* **C08L** *23/12, 23/14*

U.S. Cl. 260—23 H **8 Claims**

1. In the process of producing polypropylene films by extruding a resinous polymer of propylene into an aqueous quench bath the improvement which comprises using a resinous polymer of propylene having at least 75 percent by weight propylene containing a divalent salt of pelargonic acid as a halide scavenger, wherein said divalent metal salt comprises at least one member selected from the group consisting of barium, calcium, strontium, zinc and magnesium.

4,075,148

WATER-BASED COATING COMPOSITIONS

Jean Zatmann, Neuilly, France, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 8, 1975, Ser. No. 594,171

Claims priority, application France, July 12, 1974, 74 24335; Dec. 10, 1974, 74 40526

Int. Cl.[2] C08L *63/10*

U.S. Cl. 260—23 EP **20 Claims**

1. A process for obtaining coating compositions containing the reaction product of epoxy resins having free oxirane functional groups and of diene polymers modified by carboxylic acids or anhydrides, said compositions being water-soluble after neutralization with a base, which comprises reacting until said free oxirane functional groups have reacted:

(1) at least one epoxy resin containing 1 to 2 free oxirane groups, with

(2) at least one compound obtained by the reaction of a diene polymerizate with an alpha, beta-unsaturated carboxylic or dicarboxylic acid or anhydride, in the presence of a liquid alcohol moderator solvent at a temperature of at least about 130° C., said liquid alcohol moderator solvent remaining in a liquid state at said reaction temperature during reaction of said free oxirane groups.

4,075,149

AQUEOUS UREA-FORMALDEHYDE RESIN COMPOSITIONS HAVING IMPROVED STORAGE LIFE

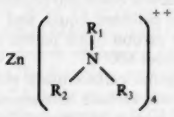
Pallavoor R. Lakshmanan, Houston, Tex., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 589,335, June 23, 1975, abandoned. This application Feb. 24, 1977, Ser. No. 771,608

Int. Cl.[2] C08L 61/24

U.S. Cl. 260—29.4 R 5 Claims

1. A method for preparing an aqueous solution of a urea-formaldehyde resin having a reduced tendency to polymerize at ambient temperature, which consists essentially of heating one mol of urea with 1.5 – 2.0 mols of formaldehyde in an aqueous medium, adjusting the pH of the resulting resin solution to a value greater than 7.0 by adding ammonium hydroxide to the solutions as the sole alkali, concentrating the resin solution by distillation so that it contains at least 50% by weight of resin solids, and incorporating into the resin solution a minor quantity of a salt of a complexed zinc ion sufficient to retard the rate of polymerization of the urea-formaldehyde resin at ambient temperature, said complexed zinc ion having the structure:



where R_1, R_2 and R_3 are independently selected from the group consisting of hydrogen atoms and lower alkyl groups containing up to 5 carbon atoms.

4,075,150

COMPOSITION FOR CURING POLYURETHANES

Guenther Kurt Hoeschele, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 30, 1977, Ser. No. 782,949

Int. Cl.[2] C08G 18/32; C09K 3/00; C08K 5/52, 5/10

U.S. Cl. 260—30.6 R 14 Claims

2. A composition, useful for curing a polyurethane prepolymer, which comprises

A. a substantially inert organic liquid in an amount equal to about 20–90% based on the combined weight of components A and B,

B. dispersed in component A, particles of a complex of 3 moles of 4,4′-methylenedianiline and 1 mole of a salt selected from the group: sodium chloride, sodium bromide, sodium iodide, lithium chloride, lithium bromide, and lithium iodide,

said particles being present in an amount equal to about 10–80% based on the combined weight of components A and B,

said particles having an average diameter of less than 60 microns, and

C. the reaction product obtained by adding an aromatic mono-carbodiimide to a mixture of A and B which has a free methylenedianiline content of about 0.1–5% by weight, and allowing said carbodiimide to react with said methylenedianiline, the amount of monocarbodiimide added being at least 0.2 equivalent per equivalent of free methylenedianiline originally present in said mixture.

12. A heat-curable composition, useful for preparing cured polyurethane products, which comprises

I. the composition defined in claim 2 and

II. an isocyanato-terminated prepolymer,

the ratio of components I and II being such that the composition contains about 0.7–1.2 equivalents of amine groups per equivalent of NCO groups.

4,075,151

SOLID, RAPID-SETTING, RIGID POLYURETHANES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 574,210, May 5, 1975, Pat. No. 3,989,663, which is a division of Ser. No. 405,244, Oct. 10, 1973, which is a continuation-in-part of Ser. No. 327,630, Jan. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 221,784, Jan. 28, 1972, abandoned. This application May 27, 1976, Ser. No. 690,460

The portion of the term of this patent subsequent to June 29, 1993, has been disclaimed.

Int. Cl.[2] C08K 5/06; C08G 18/50

U.S. Cl. 260—33.2 R 12 Claims

1. A rigid, non-cellular, solid composition having a density of at least 1 g/cc, a percent elongation of less than 100 and which is demoldable within about 5 minutes, without the application of an external source of heat, after admixture of the components of a rapid-setting polyurethane-forming composition, free of catalytic quantities of a catalyst for urethane formation, and comprising

A. an amine initiated polyol having an OH equivalent weight of from about 50 to less than about 250;

B. an organic aromatic polyisocyanate;

C. a liquid modifier compound having a boiling point above about 150° C selected from the group consisting of non-ester-containing non-hydroxyl-containing polyoxyalkylene compounds and mixtures thereof; and

wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1 and component (C) is employed in quantities of from about 5% to about 60% by weight of the combined weight of components (A), (B) and (C).

4,075,152

PROCESS FOR STABILIZING PIGMENT DISPERSIONS IN URETHANE COATINGS

Robert Arthur Taller, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 2, 1976, Ser. No. 672,951

Int. Cl.[2] C08L 75/04

U.S. Cl. 260—37 N 12 Claims

1. In the process of producing a pigmented two-package urethane coating, the improvement which comprises:

a. forming a slurry predispersion of the pigment in an amount of an organic polyisocyanate from 0.5 to 50% by weight of the pigment; then

b. dispersing the slurry predispersion in the polyol package.

4,075,153

CORROSION-RESISTANT EPOXY-AMINE CHROMATE-CONTAINING PRIMERS

Angelo Frank Leo, Palatine Township, Cook County, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Oct. 1, 1976, Ser. No. 728,714

Int. Cl.[2] C08L 63/02

U.S. Cl. 260—37 EP 21 Claims

1. A corrosion-resistant two component epoxy-amine primer system comprising a mixture of two components, said first component comprising a resinous polyepoxide having an average molecular weight in the range of about 350 to 6000 in a liquid vehicle and said second component comprising a solution of an epoxy curing agent carrying a plurality of amino hydrogen atoms, at least one inorganic corrosion-resistant chromate pigment present in at least one of said components, and at least one of said components containing a finely divided siliceous material carrying OH groups prereacted with the alkoxy group of a polyalkoxy silane or siloxane carrying at least one active hydrogen atom on an amine or mercaptan substituent.

4,075,154
ROOM-TEMPERATURE CURING ORGANOPOLYSILOXANE COMPOSITIONS

Kunio Itoh; Toshio Takago, both of Annaka; Tamio Sato, Takasaki, and Hisashi Aoki, Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 742,832, Nov. 18, 1976, abandoned, which is a continuation of Ser. No. 636,660, Dec. 1, 1975, abandoned. This application May 16, 1977, Ser. No. 796,865

Claims priority, application Japan, Nov. 29, 1974, 49-138056

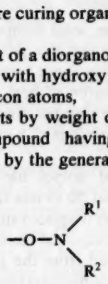
Int. Cl.[2] C08L *83/04*

U.S. Cl. 260—37 SB **15 Claims**

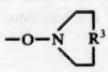
1. A room-temperature curing organopolysiloxane composition comprising

a. 100 parts by weight of a diorganopolysiloxane terminated at both chain ends with hydroxy groups directly bonded to the terminal silicon atoms,

b. from 0.1 to 30 parts by weight of a nitrogen-containing organosilicon compound having substituted aminoxy groups represented by the general formula



where R^1 and R^2 are each the same or different monovalent hydrocarbon groups or by the general formula



where R^3 is a divalent organic group, such aminoxy groups being at least 2.01 per molecule in number on an average,

c. from 0.05 to 10 parts by weight of a salt of a metal selected from the metallic elements belonging to the second, third, fourth and eighth groups in the Periodic Table having at least one inorganic counter anion, and

d. from 1 to 200 parts by weight of an inorganic filler with basicity.

4,075,155
MOLDING COMPOUNDS

Thomas E. Philipps, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 647,487, Jan. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 524,732, Nov. 18, 1974, abandoned. This application Dec. 17, 1976, Ser. No. 751,569

Int. Cl.[2] C08K *3/40*

U.S. Cl. 260—38 **17 Claims**

1. A new and improved process for producing molding compounds comprising: mixing a liquid aldehyde condensate resole with inorganic fillers containing a divalent base to form a paste with the ratio of the resole to fillers being between 4:1 and 1:5, incorporating inorganic fibers into the paste, and converting the resole into a thickened state around the fillers to produce a mechanically handleable molding compound in which the resin will not separate from the filler.

4,075,156
PRODUCTION OF NON-CARCINOGENIC LARGE PARTICLE CARBON BLACK

Paul H. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 30, 1976, Ser. No. 681,974

Int. Cl.[2] C08K *3/04*

U.S. Cl. 260—42.47 **7 Claims**

1. A process for the production of a non-carcinogenic large particle carbon black comprising

a. pyrolytically in a carbon black furnace decomposing a hydrocarbon feedstock having a low carbon residue of less than 0.2 weight % such as to form a smoke containing a carbon black having a CTAB surface area of less than about 80 m^2/g,

b. severly aftertreating said smoke by subjecting it to at least one of the steps of late quenching and secondary air injection such as to produce a smoke containing a carbon black having a photelometer of about 100% and a pitting degree defined as the difference between the nitrogen surface area in square meters per gram and the CTAB surface in square meters per gram of 0.2 m^2/g or more,

c. oxidizing said carbon black and pelleting the carbon black with an aqueous pelleting liquid, and

d. drying the wet carbon black pellets at a temperature of about 500° to about 600° F.

5. A non-carcinogenic carbon black obtained by pyrolytically in a carbon black furnace decomposing a hydrocarbon feedstock having a carbon residue of less than 0.2 weight percent such as to form a smoke containing a carbon black, severely aftertreating said smoke by subjecting it to at least one of the steps of late quenching and secondary air injection, oxidizing said carbon black and pelleting the carbon black and an aqueous pelleting liquid and drying the wet carbon black pellets at a temperature of about 500° to about 600° F., said carbon black being characterized by having

a CTAB surface area of less than 80 square meters per gram,

a pitting degree of 0.2 square meters per gram or more,

said pitting degree being defined as the difference between the nitrogen surface area in square meters per gram and the CTAB surface area in square meters per gram,

a photelometer of 100%

and a content of benzene extractables of less than 0.05 weight percent.

4,075,157
PRODUCTION OF NON-CARCINOGENIC CARBON BLACK

Paul H. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 30, 1976, Ser. No. 681,975

Int. Cl.[2] C08K *3/04*

U.S. Cl. 260—42.47 **7 Claims**

1. A process for the production of a non-carcinogenic normal curing carbon black which comprises

a. pyrolytically in a carbon black furnace decomposing a hydrocarbon feedstock having a low carbon residue of less than about 0.2 weight % such as to form smoke containing carbon black,

b. severely aftertreating said smoke by subjecting it to at least one of the steps of late quenching and secondary air injection to produce a smoke containing a carbon black of about 100% photelometer and a pitting value of about 15 m^2/g or more, in the case of a small particle carbon black having a CTAB surface of 120 $m^{2/g.}$ of 7 m^2/g or more for the carbon black having a CTAB surface area of 80 m^2/g or more, and of 0.2 m^2/g or more in the case of a large particle carbon black having a CTAB surface of 30 m^2/g, said pitting value defined as the difference between the nitrogen surface area and the CTAB surface area, both in square meters per gram,

c. separating said carbon black from said carbon black-containing smoke,

d. oxidizing said carbon black and pelleting the carbon black with an aqueous pelleting agent,
e. drying the wet carbon black pellets at a temperature of about 500° to 600° F,
f. heat treating the dried carbon black pellets at a temperature in the range of about 1000° to 1400° F and thereafter recovering the dried carbon black pellets as the product of the process.

5. A non-carcinogenic normal curing carbon black obtained by pyrolytically in a carbon black furnace decomposing a hydrocarbon feedstock having a carbon residue of less than about 0.2 weight per cent such as to form a smoke containing carbon black, severely aftertreating said smoke by subjecting it to at least one of the steps of late quenching and secondary air injection, separating said carbon black from said carbon black containing smoke, oxidizing said carbon black and pelleting said carbon black with an aqueous pelleting agent, drying the wet carbon black pellets at a temperature of about 500° to 600° F., heating the dried carbon black pellets at a temperature in the range of about 1000° to 1400° F., the thus obtained carbon black being further characterized by having

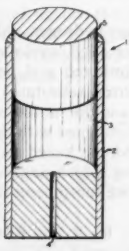
a photelometer of 100 percent
a pitting degree of about 15 m^2/g or more in the case of a small particle carbon black having a CTAB surface of 120 m^2/g, a pitting degree of 7 m^2/g or more for a carbon black having a CTAB surface area of 80 m^2/g and a pitting degree of 0.2 m^2/g or more in the case of a large particle carbon black having a CTAB surface area of 30 m^2/g, the minimum pitting degree of a carbon black having other CTAB surface areas being obtained by interpolation, said pitting value being defined as the difference between the nitrogen surface area and the CTAB surface area, both in square meters per gram,
and a content of benzene extractables of less than 0.05 weight percent.

4,075,158

FLEXIBLE PRODUCT MADE FROM A POLY(PHENYLENE SULFIDE) BLEND AND METHOD OF MAKING SAME

Harold D. Coale, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 15, 1975, Ser. No. 640,986
Int. Cl.[2] C08K *7/14;* C08L *27/12*
U.S. Cl. 260—42.17 **6 Claims**



1. An extruded product comprising:
(a) an integral mass comprised of a mixture of poly(phenylene sulfide) in an amount of at least approximately 30 percent by weight of the total mixture weight and filler which includes at least polytetrafluoroethylene in an amount of at least approximately 20 percent by weight of the total mixture weight, said mixture having a stiffness of less than about 10,000 psi as measured by ASTM D747-70.

4,075,159

RUBBER COMPOSITIONS WITH BENZOIC ACID COMPOUNDS

Tsuneo Koyama; Yuichi Sugiyama; Teruhide Furuhama; Yoshio Tajima, all of Hiratsuka; Hiroshi Kakiuchi, Yokohama; Kazuhiro Yamada, Ihehara, and Masaaki Obara, Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 588,047, June 18, 1975, abandoned.
This application Sept. 14, 1976, Ser. No. 723,200
Claims priority, application Japan, June 21, 1974, 49-70258
Int. Cl.[2] C08F *8/28, 8/34;* C08C *19/20*
U.S. Cl. 260—42.47 **6 Claims**

1. A vulcanizable rubber composition that is fumeless during mixing together of the composition comprising a rubber selected from the group consisting of natural rubber, polyisoprene rubber, polybutadiene rubber, styrene-butadiene copolymer rubber, acrylonitrile-butadiene copolymer rubber, chloroprene rubber or mixtures thereof, a formalin generating compound selected from the group consisting of hexamethylenetetramine or hexamethylolmelamine; hydrous silicic acid; and benzoic acid or monohydroxy benzoic acid in the range of from 1 to 20 parts by weight per 100 parts of the rubber.

4,075,160

NON-CARCINOGENIC CARBON BLACK

King L. Mills, and Paul H. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 30, 1976, Ser. No. 681,976
Int. Cl.[2] C08K *3/04*
U.S. Cl. 260—42.47 **8 Claims**

1. A process for the production of a non-carcinogenic carbon black comprising
a. pyrolytically in a carbon black furnace decomposing a hydrocarbon feedstock having a low carbon residue of less than about 0.2 weight % such as to form a smoke containing a carbon black having a CTAB surface area of about 80 m^2/g or more,
b. aftertreating said smoke by subjecting it to at least one of the steps of late quenching and secondary air injecting such as to produce a smoke containing a carbon black having a photelometer of about 100% and a pitting degree defined as the difference between the nitrogen surface area and the CTAB surface area of 7 m^2/g or more,
c. oxidizing the carbon black and pelleting the carbon black with an aqueous pelleting agent, and
d. drying the wet carbon black pellets at a temperature of about 500° to 600° F.

5. A non-carcinogenic carbon black obtained by a pyrolytic decomposition in a carbon black furnace of a hydrocarbon feedstock having a carbon residue of less than about 0.2 weight percent into a carbon black containing smoke, aftertreating said carbon black containing smoke by subjecting it to at least one of the steps of late quenching and secondary air injecting, oxidizing the so-produced carbon black and pelleting the carbon black with an aqueous pelleting agent and drying the wet carbon black pellets at a temperature of about 500° to 600° F., said carbon black being further characterized by having

a CTAB surface area of 80 m^2/g or more
a pitting degree of 7 m^2/g or more, said pitting degree being defined as the difference between the nitrogen surface area in the CTAB surface area,
a photelometer of 100 percent, and
a content of benzene extractables of less than 0.05 weight percent.

4,075,161
ESTERS AND AMIDES OF 2,4,6-TRIALKYL-3-HYDROXY-PHENYLALKANOIC ACIDS

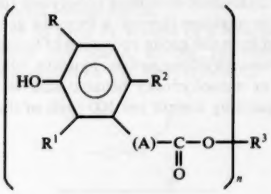
John D. Spivack, Spring Valley, and Martin Dexter, Briarcliff Manor, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 494,156, Aug. 2, 1974, Pat. No. 3,988,363, which is a continuation-in-part of Ser. No. 400,603, Sept. 25, 1973, abandoned. This application June 7, 1976, Ser. No. 693,390

Int. Cl.[2] C08K 5/20, 5/34, 5/12

U.S. Cl. 260—45.8 A 29 Claims

1. A composition of matter comprising an organic material subject to deterioration and from 0.01 to 5% by weight of a stabilizing compound of the formula



wherein

R is a branched alkyl of 3 to 8 carbon atoms,

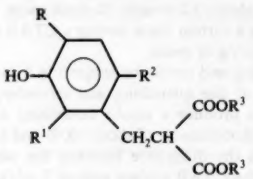
R^1 and R^2 are alkyl of 1 to 3 carbon atoms,

R^3 is alkyl of 1 to 18 carbon atoms; 2-(alkylthio)-ethyl of 5 to 21 atoms in the chain, alkylene of 2 to 6 carbon atoms; 3,6-dioxa-1,8-octamethylene; or a polyvalent saturated aliphatic hydrocarbon radical of 3 to 7 carbon atoms where n is 3 or 4,

A is a straight chain alkylene of 1 to 3 carbon atoms, and

n is an integer of 1 to 4.

13. A composition of matter comprising an organic material subject to deterioration and from 0.01 to 5% by weight of a stabilizing compound of the formula



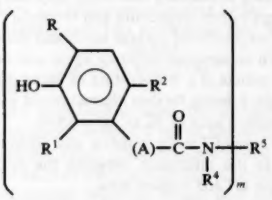
wherein

R is a branched alkyl of 3 to 8 carbon atoms,

R^1 and R^2 are alkyl of 1 to 3 carbon atoms, and

R^3 is alkyl of 1 to 18 carbon atoms.

20. A composition of matter comprising an organic material subject to deterioration and from 0.01 to 5% by weight of stabilizing compound of the formula



wherein

R is a branched alkyl of 3 to 8 carbon atoms,

R^1 and R^2 are alkyl of 1 to 3 carbon atoms,

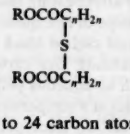
R^4 is hydrogen, lower alkyl of 1 to 4 carbon atoms or cyclohexyl,

R^5 is alkyl of 1 to 18 carbon atoms; alkylene of 2 to 12 carbon atoms or oxydiethylene, or

R^4 and R^5 together form a piperazinyl ring incorporating both nitrogen atoms when m is 2,

A is straight chain alkylene of 1 to 3 carbon atoms, and m is an integer of 1 to 2.

22. A composition according to claim 20 containing additionally from 0 to 2% by weight of a thio co-stabilizer having the formula



wherein R is alkyl of 6 to 24 carbon atoms and n is 1 to 6.

26. A composition according to claim 22 wherein the stabilizing compound is N-methyl-N-n-octadecyl-(4-tert-butyl-2,6-dimethyl-3-hydroxyphenyl)acetamide.

4,075,162
BICHROMOPHORIC BENZOXAZOLE-STYRENE ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

Gether Irick, Jr.; Charles A. Kelly, both of Kingsport, and James C. Martin, Johnson City, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 16, 1976, Ser. No. 715,012

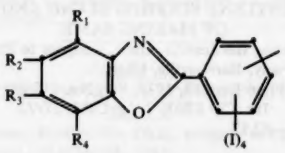
Int. Cl.[2] C08K 5/35

U.S. Cl. 260—45.8 NZ 62 Claims

1. An organic composition susceptible to ultraviolet light degradation stabilized against such degradation with a stabilizing amount of at least one bichromophoric compound having the formula:

A—B—C

wherein A is a group having the structure



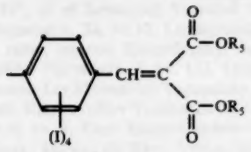
wherein

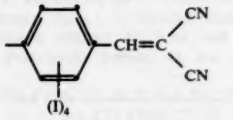
R_1, R_2, R_3 and R_4 are hydrogen, chloro, bromo, lower alkyl, substituted lower alkyl, cyclohexyl, substituted cycloalkyl, phenyl, substituted aryl, lower alkylaryl, aryl-substituted-aryl, alkoxy, substituted amino, cyano, carboalkoxy, acetamido and the substituents R_1 and R_2, R_2 and R_3, and R_3 and R_4, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;

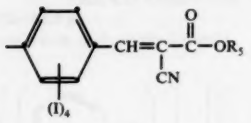
I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the heterocyclic ring and the carbon atom attached to the B group connecting the heterocyclic aromatic A group with the aromatic C group, wherein B is a linking group connecting A and C and is oxy, carbonyloxy, oxycarbonylalkyleneoxy, oxyalkyleneoxycarbonyloxy, oxyalkylenecarbonyloxy, oxycarbonyloxy, alkyleneoxy, alkyleneoxyalkyleneoxy, oxyalkylenearylenealkyleneoxy, thio, thioalkyleneoxy, sulfinyldioxy, oxy(alkoxy)phosphinooxy, carbonylamino, N-

alkylcarbonylamino, N-arylcarbonylamino, aminocarbonylalkyleneoxy, N-alkylaminocarbonylalkyleneoxy, N-arylaminocarbonylalkyleneoxy, aminocarbonylamino, N-alkylaminocarbonylamino, N-alkylamino, N-arylamino, N-alkylaminoalkyleneoxy, N-arylaminoalkyleneoxy, oxyalkyleneoxy, oxyaryleneoxy; and

wherein C is a group having the formula

1.


2.


3.


where I is the same substituent as listed above and is present in all positions of the benzenoid rings except the carbon atom attached to the B group connecting the A and C moieties, and said I substituents can all be one of the substituents listed above or different listed substituents and R_5 is an alkyl group containing 1 to 20 carbon atoms or a hydroxyalkyl group or an alkoxyalkyl group.

4,075,163
BENZENE PHOSPHONOUS ACID COMPOUNDS, THEIR PRODUCTION AND USE AS STABILIZERS FOR ORGANIC MATERIALS

Kurt Hofer, Muenchenstein, and Guenther Tscheulin, Frick, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

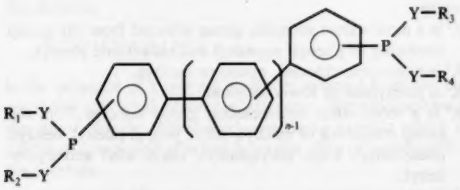
Division of Ser. No. 463,867, April 25, 1974, Pat. No. 3,962,175, which is a division of Ser. No. 191,079, Oct. 20, 1971, Pat. No. 3,825,629. This application Mar. 19, 1976, Ser. No. 668,598

Claims priority, application Switzerland, Oct. 22, 1970, 15605/70; June 30, 1971, 9597/71

Int. Cl.[2] C08K *5/50, 5/53*

U.S. Cl. 260—45.7 P **13 Claims**

1. A composition stabilized against the effect of light, oxygen and/or heat which comprises an organic polymeric material which is sensitive to said effect and an effective amount of a stabilizing agent of the formula



wherein each of

R_1, R_2, R_3 and R_4, independently, is a hydrocarbon radical of up to 16 carbon atoms, selected from the group consisting of alkyl which is unsubstituted or substituted by methoxy, phenoxy, cresoxy or chloro, cycloalkyl, aryl which is unsubstituted or substituted by methoxy or chloro, alkylaryl and benzyl which is unsubstituted or substituted by chloro,

Y is oxygen or sulphur

n is 1 or 2 and

the polyphenylene moiety is unsubstituted or substituted by alkyl, cycloalkyl, chlorine, bromine or alkoxy.

4,075,164
FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 429,120, Dec. 28, 1973, Pat. No. 3,940,366. This application Dec. 22, 1975, Ser. No. 642,993

The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.

Int. Cl.[2] C08K *5/42*

U.S. Cl. 260—45.7 S **11 Claims**

1. A flame retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and a minor amount of a mixture of a metal salt of a monomeric substituted aromatic sulfonic acid and a polymeric substituted aromatic sulfonic acid or a polymeric substituted aromatic sulfonic acid, and wherein said metal salts thereof are selected from the group consisting of the alkali metal salts and the alkaline earth metal salts, and mixtures thereof, and said substituent on the metal salts of the substituted aromatic sulfonic acid is selected from the group consisting of an electron withdrawing radical and mixtures thereof.

4,075,165
STABILIZATION OF POLYMERS BY PENTA- OR HEXA-SUBSTITUTED 4-PIPERIDINOL DERIVATIVES

Nobuo Soma; Tomoyuki Kurumada, both of Tokyo, Japan; Heimo Brunetti, Reinach, and Jean Rody, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 19, 1976, Ser. No. 687,793

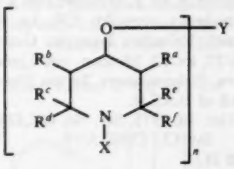
Claims priority, application Japan, May 28, 1975, 50-63850

Int. Cl.[2] C07D *211/6;* **C08K** *5/34*

U.S. Cl. 260—45.8 N **11 Claims**

1. A polymer composition stabilized against photo- and thermal-deterioration wherein there is incorporated, in an amount sufficient to prevent said deterioration, a stabilizer comprising a 4-piperidinol derivative having the formula (I):

(I)



wherein:

R^a and R^b are the same or different and each represents a hydrogen atom, a lower alkyl group, an alkenyl group, an alkynyl group or an aralkyl group, provided that R^a and R^b do not simultaneously represent hydrogen atoms;

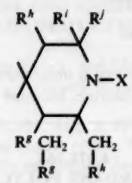
R^c and R^d are the same or different and each represents a lower alkyl group;

R^e represents an alkyl group;

R^f represents an alkyl group, a phenyl group, an aralkyl group or a 5- or 6-membered aromatic heterocyclic group containing an oxygen, sulphur or nitrogen atom;

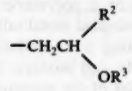
or

R^e and R^f, together with the carbon atom to which they are attached, represent a cycloalkyl group or a group of the formula:



(wherein R^g and R^h are the same or different and each represents a hydrogen atom or a lower alkyl group, provided that R^h does not represent a hydrogen atom when R^g represents a lower alkyl group; R^i and R^j are the same or different and each represents a lower alkyl group; and X is as hereafter defined):

X represents a hydrogen atom, an oxyl radical, an alkyl group, an alkenyl group, an alkoxyalkyl group, an aralkyl group, which is unsubstituted or which has one or more substituents in its aryl moiety, a 2,3-epoxypropyl group, a group of formula $-CH_2COOR^1$ (wherein R^1 represents an alkyl group, an alkenyl group, a phenyl group, an aralkyl group or a cyclohexyl group), a group of formula:



(wherein R^2 represents a hydrogen atom, a methyl group or a phenyl group and R^3 represents a hydrogen atom or an acyl group), an aliphatic acyl group or a group of formula $-COOR^4$ (wherein R^4 represents an alkyl group, a benzyl group or a phenyl group);

Y represents an organic or inorganic group or atom having a valency of from 1 to 4 and having essentially no adverse effect on the polymer stabilization activity; and n is an integer of from 1 to 4 inclusive.

4,075,166

METHOD OF STABILIZATION OF RUBBERS AND VULCANIZATES

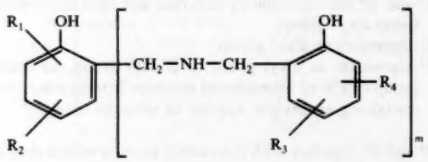
Vladimir Vasilievich Moiseev, Leninsky prospekt, 63, kv. 12; Vladimir Vasilievich Kosovtsev, Leninsky prospekt, 13, kv. 13; Galina Prokofievna Kolesnikova, ulitsa Karla Marxa, 92, kv. 23; Viktor Alexandrovich Zimnukhov, ploschad Lenina, 15, kv. 44; Lidia Alexeevna Miroshnikova, ulitsa Revoljutsii 1905 goda, 7, kv. 69, all of Voronezh; Esfir Abramovna Kimel, Tretya Vladimirskaya, 6, kv. 2, Moscow; Edit Konstantinovna Chefranova, Oktyabrsky prospekt, 120, kv. 95, Ljubertsy Moskovskoi oblasti; Valentina Ivanovna Guseva, Proletarskayaprospekt, 16/37, kv. 53, Moscow, and Ljudmila Vladimirovna Masagutova, Naberezhnaya Tarasa Shevchenko, 1/2, kv. 7, Moscow, all of U.S.S.R.

Filed Oct. 10, 1975, Ser. No. 621,624

Int. Cl.[2] C08K *5/18*

U.S. Cl. 260—45.95 H **17 Claims**

1. A method of stabilization of synthetic polydiene and copolymeric diene rubbers and their vulcanizates which comprises incorporation of phenolamine resins as antioxidants into said rubbers, a solution or latex thereof, said phenolamine resins having the formula



wherein R_1, R_2, R_3 and R_4 are each alkyl of from 1 to 12 carbon atoms, alkenynyl, aralkyl, hydroxy aralkyl, halogen, or carboxy and m is 2–20, obtained by condensation of hexamethylene tetramine with alkyl-, alkenynyl-, dialkyl-, aralkyl- or halo-substituted phenols, with dihydroxydiphenyl alkanes, hydroxybenzoic acids or mixtures of said resins with antioxidants selected from the series of secondary amines, diamines, 2,6-dialkyl derivatives of phenol, and phosphorus- and sulphur- containing compounds.

4,075,167

MALEIMIDO GROUP-CONTAINING ORGANOSILICON COMPOUNDS

Minoru Takamizawa; Yasushi Yamamoto; Yoshio Inoue, all of Annaka; Atsumi Noshiro, Chiba, and Hitoshi Fujii, Tokyo, all of Japan, assignors to Dai Nippon Printing Co., Ltd. and Shin-Etsu Chemical Co., Ltd., both of Tokyo, Japan

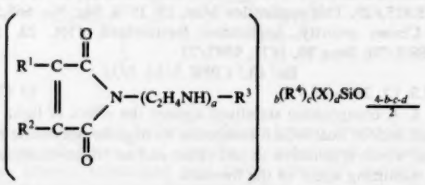
Filed Dec. 24, 1975, Ser. No. 644,319

Claims priority, application Japan, Dec. 28, 1974, 50-3997

Int. Cl.[2] C08G *77/04*

U.S. Cl. 260—46.5 E **10 Claims**

1. An organosilicon compound represented by the formula



wherein

R^1 is a monovalent aromatic group selected from the group consisting of phenyl, naphthyl and substituted phenyl,

R^2 is hydrogen, chlorine, cyano or methyl,

R^3 is phenylene or lower alkylene,

R^4 is a monovalent hydrocarbon group selected from the group consisting of methyl, ethyl, propyl phenyl, benzyl, phenylethyl, tolyl, ethylphenyl, vinyl, allyl and cyclohexyl,

X is selected from the group consisting of hydroxy, halogen, alkoxy, acyloxy and aminoxy

a is zero or 1,

b is a positive number not exceeding 1, and

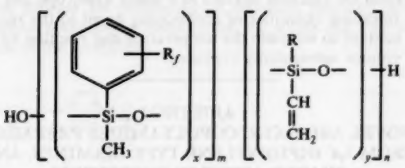
c and d each are zero or positive numbers not exceeding 3 with the proviso that $b+c+d$ is a positive number not exceeding 4.

4,075,168
FLUOROSILOXANE DIOLS AND METHOD OF PRODUCING SAME

Alexei Ivanovich Ponomarev, prospekt Stachek, 59, korpus 2, kv. 47; Sergei Vasilievich Sokolov, ulitsa III Internatsionala, 67, kv. 222; Julia Alexeevna Larionova, prospekt Elizarova, 12, kv. 15; Tatyana Ivanovna Rymareva, bulvar Novatorov, 14, kv. 16; Alexandr Leibovich Klebansky, ulitsa Zhelyabova, 10, kv. 107, all of Leningrad; Vsevolod Volfovich Berenblit, ulitsa Nagornaya, 23, kv.10, Leningradskaya oblast, Vsevolozhsky raion, poselok Kuzmolovsky; Jury Pavlovich Dolnakov, ulitsa Narvskaya, 4, kv. 122, Leningradskaya oblast, Krasnoe selo; Lev Moiseevich Yagupolsky, ulitsa Ivana Kudri, 41, kv. 48, Kiev; Vladlen Vasilievich Malovik, ulitsa Osipovskogo, 4/5, kv. 6, Kiev; Miron Onufrievich Lozinsky, ulitsa Voroshilova, 18, kv. 13, Kiev; Viktor Mikhailovich Belous, ulitsa Ujutnaya, 5a, kv. 3, Odessa; Boris Efimovich Gruz, ulitsa Kurskaya, 10a, kv. 18, Kiev, and Ljubov Antonovna Alexeeva, Proletarsky bulvar, 41, kv. 28, Odessa, all of U.S.S.R.

Filed July 13, 1976, Ser. No. 704,924
Int. Cl.[2] C08G 77/04
U.S. Cl. 260—46.5 R **1 Claim**

1. Fluorosiloxane diols of the formula



where:
$R_F = OCF_3$, OC_2F_5, $OC_2F_4OCF_3$, $C_2F_4OCF_3$, C_3F_7,
$R = CH_3$, C_6H_5,
$x = 1.0 - 0.97$,
$y = 0 - 0.03$,
$m = 2.3 - 187.2$
$n = 0 - 3.8$
with an average molecular weight of 620 – 51,200.

4,075,169
FLUOROSILOXYDIPHENYLSILOXY BLOCK COPOLYMERS

John S. Razzano, Watervliet, N.Y., assignor to General Electric Company, Waterford, N.Y.

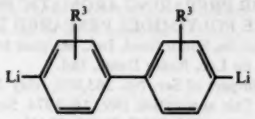
Continuation of Ser. No. 621,032, Oct. 9, 1975, Pat. No. 4,028,338. This application Dec. 15, 1976, Ser. No. 750,994
Int. Cl.[2] C08G 77/04
U.S. Cl. 260—46.5 R **8 Claims**

1. A process for producing a solvent resistant block copolymer comprising (a) reacting in an anhydrous system a trimer of the formula,

$$[(R)(R' CH_2CH_2)SiO]_3$$

in the presence of a solvent promoter selected from the class consisting of tetrahydrofuran, dioxane, dimethylformamide, dimethylsulfoxide, tetramethyl urea, and a catalyst which is a dilithium compound selected from the class of compounds of the formula,

and compounds of the formula,



where R^2 and R^3 are selected from the class consisting of hydrogen and lower alkyl radicals of 1 to 8 carbon atoms, and then adding a trimer of the formula,

$$[(C_6H_5)_2SiO]_3$$

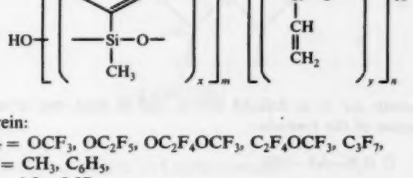
and completing the reaction.

4,075,170
FLUOROSILOXANE RUBBERS AND PROCESS FOR PRODUCING SAME

Alexei Ivanovich Ponomarev, prospekt Stachek, 59, korpus 2, kv. 47; Julia Alexeevna Larionova, prospekt Elizarova, 12, kv. 15; Anatoly Kirillovich Ankudinov, ulitsa Lensoveta, 10, kv. 203; Rufina Mikhailovna Ryazanova, Vitebsky prospekt, 81, korpus 1, kv. 6; Alexandr Leibovich Klebansky, ulitsa Zhelyabova, 10, kv. 107; Sergei Vasilievich Sokolov, ulitsa III Internatsionala, 67, kv. 222, all of Leningrad; Vsevolod Volfovich Berenblit, Vsevolozhsky raion, poselok Kuzmolovsky, ulitsa Nagornaya, 23, kv. 10; Jury Pavlovich Dolnakov, Krasnoe selo, ulitsa Narvskaya, 4, kv. 122, both of Leningradskaya oblast; Tatyana Ivanovna Rymareva, Bulvar Novatorov, 14, kv. 16, Leningrad; Lev Moiseevich Yagupolsky, ulitsa Ivana Kudri, 41, kv. 48, Kiev; Vladlen Vasilievich Malovik, ulitsa Osipovskogo, 4/5, kv. 6, Kiev; Miron Onufrievich Lozinsky, ulitsa Voroshilova, 18, kv. 13, Kiev; Viktor Mikhailovich Belous, ulitsa Ujutnaya, 5-a, kv. 3, Odessa; Boris Efimovich Gruz, ulitsa Kurskaya, 10-a, kv. 18, Kiev; Ljubov Antonovna Alexeeva, Proletarsky bulvar, 41, kv. 28, Odessa; Alexandr Vasilievich Karlin, ulitsa Oboronnaya, 14, kv. 31, and Vasily Danilovich Lobkov, Krasnoputilovskaya ulitsa, 109, kv. 23, both of Leningrad, all of U.S.S.R.

Filed Aug. 12, 1976, Ser. No. 713,969
Int. Cl.[2] C08G 77/04
U.S. Cl. 260—46.5 G **3 Claims**

1. Fluorosiloxane rubber of the formula:



(I)

wherein:
$R_F = OCF_3$, OC_2F_5, $OC_2F_4OCF_3$, $C_2F_4OCF_3$, C_3F_7,
$R = CH_3$, C_6H_5,
$x = 1.0 - 0.97$,
$y = 0 - 0.03$,
$m = 370.9 - 1{,}863.4$,
$n = 0 - 44.5$
and having an average molecular weight ranging from 98,000 to 410,520.

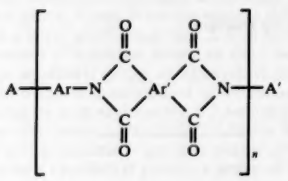
4,075,171

PROCESS FOR PREPARING AROMATIC POLYIMIDES AND SOME POLYIMIDES PREPARED THEREBY

Gaetano F. D'Alelio, South Bend, Ind., assignor to University of Notre Dame du Lac, Notre Dame, Ind.

Continuation-in-part of Ser. No. 363,800, May 25, 1973, Pat. No. 3,998,768. This application Dec. 16, 1974, Ser. No. 533,468
Int. Cl.[2] C08G *73/10, 73/12*
U.S. Cl. 260—47 CP 17 Claims

1. A process for the preparation of a substantially cyclized polyimide of the formula:



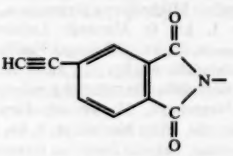
(A)

wherein

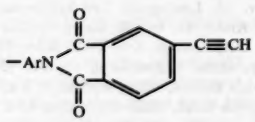
Ar is a divalent aromatic organic radical,

Ar′ is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar′ radical,

A is



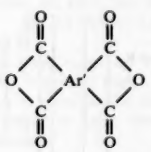
A′ is



and

n is 0 or a positive integer of at least one, soluble in a phenol which comprises:

1. reacting a reaction mixture of at least one tetracarboxylic acid dianhydride of the formula:

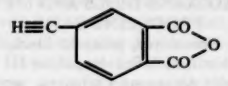


(B)

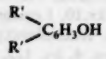
wherein Ar′ is as defined above, and at least one aromatic diamine of the formula:

C. $H_2N—AR—NH_2$

wherein Ar is as defined above, at a molar ratio of dianhydride to diamine of *m* to *m* + 1 where *m* is zero or a positive integer of at least one and as high as *n* in formula (A), with the proviso that the reaction mixture contains 2 moles of an α,β-carboxylic acid monoanhydride of the formula



in a phenol of the formula



where each R′ is hydrogen or $—CH_3$ in the presence of at least one organic azeotroping agent which:

a. gives a water azeotrope having a boiling point less than 95° C at atmospheric pressure,

b. is non-reactive with the dianhydride and the diamine, and

c. separates from water as a distinct phase,

said reaction conducted at a temperature less than 140° C and below the boiling point of said phenol and higher than the boiling point of said azeotroping agent with the vapor phase temperature being between that of the water azeotrope and no higher than 95° C.

2. removing water of reaction and the azeotroping agent from the reaction mixture as a water azeotrope and

3. returning quantities of azeotroping agent to the reaction mixture to maintain the temperature and reaction mixture volume substantially constant.

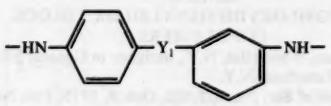
4,075,172

NOVEL AROMATIC COPOLYAMIDES PREPARED FROM 3,4′ DIPHENYLENE TYPE DIAMINES, AND SHAPED ARTICLES THEREFROM

Shuji Ozawa, Hachioji; Yasuo Nakagawa, Hino; Kichiro Matsuda, Hino; Toshio Nishihara, Hino, and Hideki Yunoki, Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

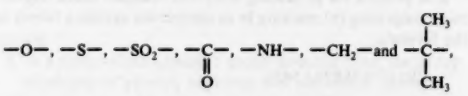
Filed Dec. 18, 1975, Ser. No. 641,898
Claims priority, application Japan, Dec. 27, 1974, 49-149027; May 20, 1975, 50-59200; May 20, 1975, 50-59201
Int. Cl.[2] C08G *69/32, 69/40, 69/42*
U.S. Cl. 260—47 CZ 15 Claims

1. A fiber- or film-forming high-molecular weight aromatic copolyamide consisting essentially of (1-A) a diamine recurring unit of the following formula



(1-A)

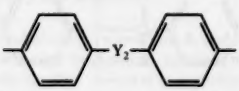
wherein Y_1 is at least one divalent-moiety selected from the group consisting of —O—, —S—, $—SO_2—$,



(1-B) a diamine recurring unit of the following formula

$—HN—AR_1—NH—$ (1-B)

wherein Ar_1 represents a phenylene group, a naphthylene group, a biphenylene group or a group of the formula



wherein Y_2 has the same definition as Y_1 and is identical to, or different from, Y_1, all of which groups have their bond chains extending in a coaxial or parallel direction, and (2) a dicarboxylic acid-type recurring unit of the following formula

$$—OC—Ar_2—CO— \quad (2)$$

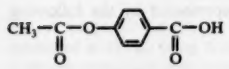
wherein Ar_2 has the same definition as Ar_1, and is identical to, or different from, Ar_1, the total mole number of the diamine recurring units of formulae (1-A) and (1-B) being substantially equal to the mole number of the dicarboxylic acid-type recurring unit of formula (2), and the proportion of the diamine recurring unit (1-A) being 7.5 to 40 mole% of the entire recurring units.

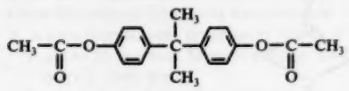
4,075,173
PROCESS FOR THE PRODUCTION OF AROMATIC POLYESTERS FROM HYDROXYBENZOIC ACID AND PRODUCTS THEREOF

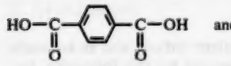
Takashi Maruyama, Toyonaka, and Katsuji Ueno, Hirakata, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

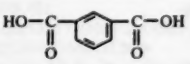
Filed Jan. 28, 1977, Ser. No. 763,554
Claims priority, application Japan, Jan. 29, 1976, 51-8947
Int. Cl.² C08G *63/18*
U.S. Cl. 260—47 C **7 Claims**

1. A process for producing an aromatic polyester which comprises preparing a prepolymer by subjecting the compounds of the formulae:


(I)


(II)


and/or


(III)

to heat-polycondensation at a temperature of 200°–380° C in the molar ratios of (I) : (II) = 1 : 100 to 100 : 1 and (II) : (III) = 1 : 10 to 10 : 1, pulverizing the prepolymer thus prepared and then heating the resultant in an inert gas or under reduced pressure at a temperature within the range of 200° to less than 380° C while raising the temperature at the rate of 1° to 20° C/hour.

4,075,174
PROMOTION OF MANGANESE CHELATE CATALYZED POLYPHENYLENE ETHER OXIDE POLYMERIZATION REACTIONS

Walter Karl Olander, Clifton Park, N.Y., assignor to General Electric Company, Pittsfield, Mass.

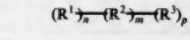
Filed Dec. 21, 1976, Ser. No. 753,509
Int. Cl.² C08G *65/44*
U.S. Cl. 260—47 ET **25 Claims**

1. In a process for the preparation of a polyphenylene oxide resin which comprises the steps of:

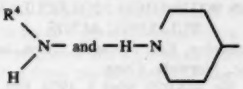
(a) oxidatively coupling a phenolic monomer to form a polyphenylene oxide resin in the presence of an organic solvent and a manganese chelate complex of the formula:

$$(L)_x Mn$$

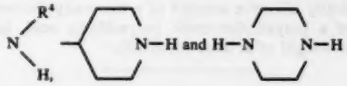
wherein L is a ligand derived from an ω-hydroxyoxime by conventional means, Mn is the transition metal manganese and x is at least equal to about 0.5, the improvement which comprises enhancing the rate of reaction by adding to the reaction mixture an amount of a bis-secondary diamine of the formula:



wherein R^1 is selected from the group consisting of:



wherein R^4 is lower alkyl of from 1 to 10 carbon atoms; R^2 is methylene; and R^3 is selected from the group consisting of:



wherein R^4 is the same as hereinabove defined; n is 0 or 1; m is 0 or a whole number from 1 to 10; and p is 0 or 1 with the proviso that the values of n and p are such that the compound always has two nitrogen atoms, said amount of said bis-secondary diamine being sufficient to increase the rate of reaction.

4,075,175
PREPARATION OF PHOTOSENSITIVE POLYALDEHYDES

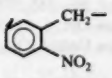
Robert Paul Foss, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 21, 1977, Ser. No. 760,934
Int. Cl.² C08G *2/12, 2/08*
U.S. Cl. 260—67 R **9 Claims**

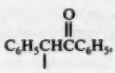
1. A process for preparing a photosensitive polyaldehyde having the formula

wherein

R is a photosensitive end group selected from


(a)

and

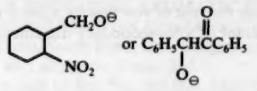

(b)

R^1 is H or n-alkyl of 1–5 carbon atoms,

R^2 is n-alkanoyl of 1–4 carbon atoms, and

n is a positive integer of about 10–4000, comprising:

contacting and anionically polymerizing a straight chain aldehyde of 1–6 carbon atoms with an initiating amount of an alkali metal or tetraalkylammonium, where each alkyl, alike or different, is from 1–6 carbon atoms, alkoxide of the formula:



4,075,176

CATALYSIS OF AMINO RESIN CROSS-LINKING REACTIONS WITH HIGH MOLECULAR WEIGHT SULFONIC ACIDS

Lawrence V. Gallacher, East Norwalk, Conn., assignor to King Industries, Inc., Norwalk, Conn.

Division of Ser. No. 466,079, May 1, 1974, Pat. No. 3,979,478. This application May 6, 1976, Ser. No. 683,778

Int. Cl.[2] C08G *12/12, 12/32*; C08L *61/32*

U.S. Cl. 260—67.6 R **16 Claims**

1. A composition comprising a convertible amino resin and a catalytically effective amount of a thermally-decomposable adduct of a polyalkylaromatic polysulfonic acid, having a molecular weight of at least about 500.

4,075,177

THERMALLY HARDENABLE CATIONIC RESIN FROM DICARBOXYLIC ACID, DIALKANOLAMINE AND POLYAMINE COPOLYMER CONDENSED WITH EPICHLOROHYDRIN

Jean-Claude Bonnet, Blois, and Gerard Tesson, Auzouer-en-Touraine, both of France, assignors to Manufacture de Produits Chimiques Protex, Paris, France

Filed Jan. 12, 1976, Ser. No. 648,037

Int. Cl.[2] C08G *63/46*

U.S. Cl. 260—75 T **4 Claims**

1. A process for producing a cationic thermally settable water soluble resin comprising the steps of:

a. readting in an acid aqueous medium a first component consisting of at least one aliphatic dicarboxylic acid with a mixture of a second component consisting of at least one polyamine and a third component consisting of at least one dialkanolamine to produce a polyamide-polyester copolymer soluble in water, where the molar ratio of said first component to said second component to said third component is substantially 0.8 to 1.1/0.3 to 0.9/0.1 to 0.7; and

b. condensing said polyamide-polyester copolymer with epichlorohydrin, said polyamide-polyester copolymer reacted with the epichlorohydrin in a proportion corresponding to 0.5 to 1.0 molecules of epichlorohydrin per atom of active hydrogen of the copolymer.

4,075,178

ORGANOALUMINUM COMPOSITIONS

John Harry Wallice Turner, Chapel-en-le-Firth, England, assignor to Manchem, Limited, London, England

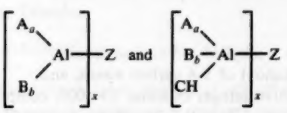
Continuation-in-part of Ser. No. 345,377, March 27, 1973, abandoned. This application Oct. 6, 1975, Ser. No. 620,239

Claims priority, application United Kingdom, Mar. 28, 1972, 14390/72

Int. Cl.[2] C08G *63/76*

U.S. Cl. 260—75 T **14 Claims**

1. A storage-stable, fluid, moisturesensitive compound of a formula selected from the group consisting of



in which A, B, and C are each selected from the group consisting of alkoxy, aryloxy, alkylcarboxyl, arylcarboxyl, a dicarboxylic acid half ester moity, a dicarboxylic acid half amide moity, alkyl sulfate, aryl sulfonate, dialkyl phosphate, alkylaryl phosphate, diarylphosphate, dialkylphosphite, alkylaryl phosphite, diarylphosphite, and an oxymetal organic group of the formula OMA in which M is a divalent metal and A is as defined herein, *a* and *b* are each selected from 0, 1 and 2 with the proviso that $a + b = 2$, Z is a polyfunctional organic polymer or polycondensation moity derived from polymers containing at least two reactive groups selected from hydroxyl, carboxyl and hydroperoxide, and *x* is at least 2, in which said polymers are selected from alkyd resins, phenolic resins, polyepoxides and silicone resins.

4,075,179

POLYESTERIMIDES AND PROCESSES FOR PREPARING SAME

Joseph Karkoski; Charles William McGregor, and Lionel Joseph Payette, all of Fort Wayne, Ind., assignors to Essex International, Inc., Fort Wayne, Ind.

Filed Dec. 24, 1975, Ser. No. 644,374

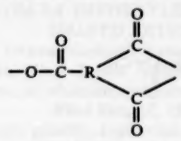
Int. Cl.[2] C08G *63/68*

U.S. Cl. 260—75 N **13 Claims**

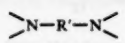
1. A solvent free hot melt polyesterimide polymer coating composition comprising the combination of:

an acid-imide component comprised of:

a tricarboxylic material unit represented by the following formula:



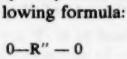
wherein: R is an organic trivalent radical, and an aromatic diamine material unit represented by the following formula:



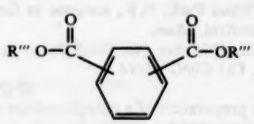
wherein: R′ is an aromatic divalent radical;

an ester component comprised of:

a hydroxyl containing material unit represented by the following formula:



wherein: R″ is an aliphatic divalent radical, and a carboxyl containing material unit represented by the following formula:



wherein: R‴ is selected from the group consisting of hydrogen and lower alkyl groups; and

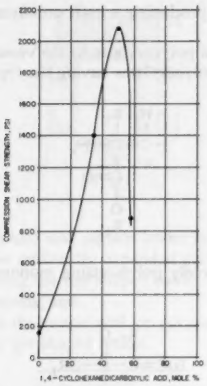
a tricarboxylic cross-link material component; said composition having an ester to imide equivalent ratio greater than about 2:1, an hydroxyl to carboxyl equivalent ratio greater than about 1.5:1, and an acid to cross-link equivalent ratio greater than about 1.5:1.

4,075,180

POLYESTERS CONTAINING A CRITICAL RANGE OF 1,4-CYCLOHEXANEDICARBOXYLIC ACID

Burns Davis, and Frederick David Petke, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 9, 1976, Ser. No. 749,190
Int. Cl.[2] C08G *63/12*
U.S. Cl. 260—75 R 3 Claims



1. A polyester having an inherent viscosity of at least 0.4 measured at 25° C. using 0.50 gram of polymer per 100 ml. of a solvent composed of 60 volumes of phenol and 40 volumes of tetrachloroethane consisting essentially of

A. a dicarboxylic acid component which is

1. about 25 to about 58 mole percent 1,4-cyclohexanedicarboxylic acid, and

2. about 75 to about 42 mole percent terephthalic acid, and

B. 1,4-butanediol.

4,075,181

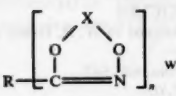
POWDER COATING COMPOSITIONS BASED ON A CYCLIC NITRILE COMPOUND

Kurt Charles Frisch, Grosse Ile, Mich., and Donald Henry Russell, Cherry Hill, N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 22, 1975, Ser. No. 643,270
Int. Cl.[2] C08G *18/04, 71/02;* B05D *1/06*
U.S. Cl. 260—77.5 B 10 Claims

1. A shelf-stable powder coating composition having a particle size range such that most of the particles have a size of about 10 to 500 microns comprised of

A. 5 to 95 parts by weight of a cyclic nitrile compound having the structural formula



wherein X is —C—, —S— or —C—C—,

R is an organic radical free from reactive hydrogens as determined by the Zerewitinoff Test and *n* is at least 2,

B. 5 to 95 parts by weight of a member selected from the group consisting of styrene-maleic anhydride copolymer having a number average molecular weight of about 1,000 to 10,000, pyromellitic anhydride and trimellitic anhydride,

C. 0.001 to 10 parts per 100 total parts of (A) and (B) of a basic condensation-rearrangement catalyst having a pKa up to 8.

4,075,182

PROCESS FOR THE PREPARATION OF A CATALYST CONTAINING PYRROLIDONE COMPOSITION

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 25, 1975, Ser. No. 607,845
Int. Cl.[2] C08G *69/24;* B01J *31/12*
U.S. Cl. 260—78 P 6 Claims

1. A process for preparing a catalyst-containing composition for the polymerization of 2-pyrrolidone consisting essentially of contacting a C_1–C_2 alkali metal alkoxide with an excess of 2-pyrrolidone to form a pyrrolidone solution comprising the alkali metal pyrrolidonate and a C_1–C_2 alcohol, and passing an inert gas, selected from the group consisting of nitrogen, dry air, and the rare gases, through said solution at a temperature of about 90° to about 200° C to remove said alcohol.

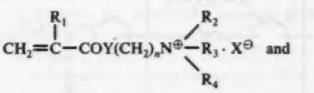
4,075,183

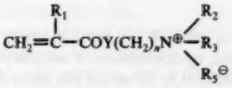
PREPARATION OF WATER-SOLUBLE HIGH POLYMERS

Shigenao Kawakami, Hirakata; Tatsumi Shibata, Ibaraki; Shinichi Isaoka, Minoo, and Tutomu Shintani, Ohita, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 18, 1975, Ser. No. 642,185
Claims priority, application Japan, Dec. 19, 1974, 49-146371; July 10, 1975, 50-85060
Int. Cl.[2] C08F *28/00;* C08G *75/00;* C08F *2/00, 20/70*
U.S. Cl. 260—79.3 MU 9 Claims

1. In the production of a water-soluble, cationic high polymer of (A) at least one of acrylamide and methacrylamide and (B) at least one of ammonium type monomers of either one of the formulas:


(I)


(II)

wherein R_1 is a hydrogen atom or a methyl group, R_2 and R_3 are each a lower alkyl group, R_4 is a hydrogen atom, a lower alkyl group, an aryl group, a hydroxy(lower)alkyl group, a benzyl group or a group of the formula: $-CH_2COO(CH_2)_mCH_3$ (*m* being an integer of 0 or 1), R_5^- is a group of either one of the formulas: $—(CH_2)_2COO^-$ and $—(CH_2)_3SO_3^-$, X is a halogen atom or an acid residue, Y is —O— or —NH— and *n* is an integer of 1 to 4, a process which comprises initiating the polymerization of the monomeric component (A) with a portion of the monomeric component (B) in an aqueous medium containing an organic solvent selected from the group consisting of acetone, acetonitrile, t-butanol, tetrahydrofuran and dioxane at a concentration of about 15 to 70% by weight until the polymerization proceeds to a certain extent and then continuing the polymerization while adding the remaining portion of the monomeric component (B) thereto under the occasional supplementation of a watermiscible organic solvent thereto so as to keep an appropriate viscosity of the reaction system to produce the high polymer.

4,075,184

METHOD OF SULFONATING FLUOROCARBON POLYMERS AND FLUOROCARBON POLYMER PRODUCED THEREBY

Thomas A. Rechlicz, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 11, 1976, Ser. No. 665,743
Int. Cl.[2] C08G *75/00*
U.S. Cl. 260—79.3 R **7 Claims**

1. A method of preparing a polymer having trifluoroethylene sulfonyl moieties comprising:

providing a liquid composition comprising a polymer having chlorotrifluoroethylene moieties, a stoichiometric excess of a thiourea compound, and an organic solvent;

maintaining the liquid composition above about 100° C. and at a pressure sufficient to maintain the composition liquid for a time sufficient to form a polymer having trifluoroethylene isothiouronium salt moieties; and

thereafter converting the polymer having trifluoroethylene isothiouronium salt moieties to a polymer having trifluoroethylene sulfonyl moieties.

4,075,185

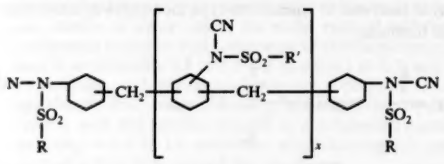
N-CYANOSULFONAMIDE RESINS AND INTERMEDIATES THEREFOR AND PRODUCTS THEREOF

Raymond J. Kray, Berkeley Heights, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 661,468, Feb. 26, 1976, which is a division of Ser. No. 439,487, Feb. 4, 1974, Pat. No. 3,944,526. This application Oct. 12, 1976, Ser. No. 731,485
The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.
Int. Cl.[2] C08G *75/30*
U.S. Cl. 260—79.3 M **15 Claims**

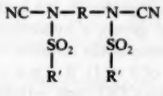
1. An addition polymerization product of

(a) an N-cyanosulfonamide compound of the formula



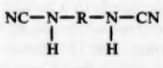
wherein each R′ is independently a monovalent aromatic, aliphatic, cycloaliphatic or heterocyclic radical; and x is 1 to 5

(b) with 0 to 20 moles per mole of (a) of a bis-N-cyanosulfonamide compound of the formula



wherein R is a divalent aromatic, aliphatic, cycloaliphatic or heterocyclic radical; and each R′ is independently a monovalent aromatic, aliphatic, cycloaliphatic or heterocyclic radical; and

(c) with 0 to 10 moles per mole of (a) of a bis cyanamide having the formula



wherein R is a divalent aromatic, aliphatic, cycloaliphatic or heterocyclic radical.

4,075,186

GRAFT COPOLYMERS OF POLYBUTADIENE AND SUBSTITUTED POLYACRYLATE

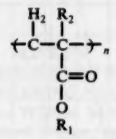
Richard J. Ambrose, Akron, and Robert A. Hayes, Cuyahoga Falls, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 518,655, Oct. 29, 1974, abandoned. This application Jan. 21, 1976, Ser. No. 651,094
Int. Cl.[2] C08L *9/00*
U.S. Cl. 260—887 **14 Claims**

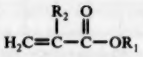
1. A process for producing a graft copolymer, in a vessel, comprising:

adding substituted polyacrylates to the vessel,

said substituted polyacrylates having the repeating unit



and produced by solely polymerizing monomers having the formula

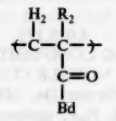


wherein R_1 is an alkyl hydrocarbon group having from 1 to 30 carbon atoms and wherein R_2 is an alkyl hydrocarbon group having from 1 through 12 carbon atoms,

said polyacrylate having a number average molecular weight of from 10,000 to about 400,000,

adding polymeric butadienyl anions to the vessel,

anionically substituting said polymeric butadienyl anions for said —OR_1 groups of said substituted polyacrylate to form the graft copolymer so that said pendant substituted site has the structure



where Bd is said polymeric butadienyl anion, and

carrying out said substitution until said graft copolymer contains from 25 to 75 percent by weight of said substituted polyacrylate, the number average molecular weight of said pendant polybutadiene ranging from 1,000 to about 200,000.

4,075,187

METHOD FOR MAKING BLOW MOLDED GENERALLY TIRE SHAPED ARTICLES

Tyler Keith Olcott, Valentines, Va., assignor to W. R. Grace & Co., Duncan, S.C.

Filed May 12, 1976, Ser. No. 685,567
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—89 **6 Claims**

1. A method for blow molding a tire shaped article, comprising:

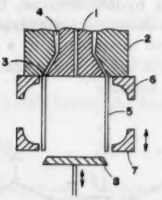
extruding a molten tubular thermoplastic parison downwardly from a die through a space intermediate two mold sections comprising an upper mold section and a lower mold section engageable with each other;

sealing a bottom opened end of the tubular parison to entrap a compressible fluid in said parison, said parison being sealed at its upper end by said die;

moving the lower mold section vertically into engaging

relationship with the upper mold section, said mold sections when engaged forming a radially extended tire shaped cavity adjacent and surrounding an intermediate portion of the parison;

moving a lower portion of the tubular parison upwardly relative to said upper end and permitting a central portion of the tubular parison to expand outwardly radially into said tire shaped cavity;



injecting fluid into said parison under sufficient pressure to conform the outwardly expanded parison portion to the molds defining the tire shaped cavity;

opening the molds; and

unsealing both the bottom and top portions of said parison to provide the tire shaped article.

4,075,188

RECOVERY OF CRUDE TALL OIL

William G. Vardell, Jr., Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Feb. 2, 1976, Ser. No. 654,383
Int. Cl.[2] C09F *1/00*
U.S. Cl. 260—97.7 8 Claims

1. A process for treating tall oil soap skimmings comprising admixing said skimmings with a water-immiscible solvent and an amount of carbon dioxide sufficient to acidify said soap to pH 7 to 8, whereby a water-immiscible solvent layer containing said acidified soap and unreacted soap is formed and a bicarbonate-brine layer is formed.

4,075,189

HEXAPEPTIDES

Francis John Tinney, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed Sept. 15, 1976, Ser. No. 723,427
Int. Cl.[2] C07C *103/52;* A61K *37/02*
U.S. Cl. 260—112.5 R 6 Claims

1. A hexapeptide of the formula

X-Pro-His(benzyl)-His(benzyl)-R-Trp-Ala-Y

wherein X is t-butoxycarbonyl or benzyloxycarbonyl, R is Ser(benzyl) or Tyr(benzyl) and Y is lower alkoxy, amino, lower alkylamino or di(lower alkyl)amino.

4,075,190

PENTAPEPTIDE WITH MORPHINE-LIKE ACTIVITY

Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,211
Int. Cl.[2] C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 R 1 Claim

1. A pentapeptide of the formula:

H-Tyr-Gly-Gly-Phe-D-Lys-OH

or a non-toxic salt thereof.

4,075,191

BIOLOGICALLY ACTIVE AMIDES

Christopher Raymond Beddell, Ashford; Lawrence Alfred Lowe, Swanley, and Samuel Wilkinson, Beckenham, all of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Oct. 24, 1975, Ser. No. 625,386
Claims priority, application United Kingdom, Oct. 25, 1974, 46167/74
Int. Cl.[2] C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 LH 6 Claims

1. Glu—Phe—Ala—Tyr—Gly—Leu—Arg—Pro—ethylamide or an acid addition salt thereof, wherein all residues are those of the L-amino acids except in the case of glycine.

6. Cyclopentylcarbonyl—Phe—Ala—Tyr—Gly—Lue—Arg—Pro—ethylamide or an acid addition salt thereof, wherein all residues are those of the L-amino acids except in the case of glycine.

4,075,192

NONAPEPTIDES AND METHODS FOR THEIR PRODUCTION

Ernest D. Nicolaides, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed June 13, 1977, Ser. No. 805,766
Int. Cl.[2] C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 LH 5 Claims

1. A nonapeptide of the formula

pGlu-D-Phe-Trp-Tyr(benzyl)-Ser(benzyl)-D-Ala-Leu-Orn-Pro-Y

wherein Y is amino, lower alkylamino or di(lower alkyl)amino.

4,075,193

PROCESS FOR PRODUCING INTRAVENOUS IMMUNE GLOBULIN

Cyrill John Campbell, Detroit, and Daniel Ting Hsiu Liu, Sterling Heights, both of Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed Nov. 26, 1976, Ser. No. 744,906
Int. Cl.[2] A23J *1/06;* A61K *35/14*
U.S. Cl. 260—112 B 10 Claims

1. Process for producing immune globulin for intravenous administration which comprises

adsorbing plasminogen deriving from blood of a selected mammalian species on an adsorbent substrate of L-lysine agarose,

washing the adsorbate to elute impurities,

eluting the purified plasminogen from the substrate,

converting the eluted plasminogen to plasmin,

incubating a mixture of said plasmin and a quantity of homospecific immune globulin having anticomplementary activity under conditions such that the anticomplementary activity is substantially reduced,

inactivating plasmin present in said mixture by adsorption on an inactivation adsorbent for plasmin, and recovering the immune globulin.

4,075,194

NOVEL SYNTHETIC UNDECAPEPTIDE AND CLINICAL ASSAY

Michael Sela; Ruth Arnon, both of Rehovot, and Samario Chaitchik, Tel-Aviv, all of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Filed Dec. 9, 1976, Ser. No. 749,093
Int. Cl.[2] C07C *103/52;* A61K *39/00*
U.S. Cl. 260—112.5 R 3 Claims

1. The synthetic undecapeptide corresponding to the terminal amino acid residues of the amino-terminal portion of carcinoembrionic antigen (CEA) of the sequence Leu-Asn-Phe-Pro-Thr-Ser-Glu-Ile-Thr-Leu-Lys.

4,075,195

DEBITTERED PROTEIN PRODUCT AND METHOD FOR MANUFACTURE

John F. Roland, Glenview, Ill., assignor to Kraft, Inc., Glenview, Ill.

Filed Aug. 31, 1976, Ser. No. 719,347
Int. Cl.[2] A23J 1/14, 1/20
U.S. Cl. 260—119 10 Claims

1. A method for debittering protein hydrolysates comprising providing an aqueous solution of a protein hydrolysate, said hydrolysate having a molecular weight of less than about 10,000 and an amino nitrogen to total nitrogen ratio of from about 0.25 to about 0.80, feeding said solution to the top of a bed of phenol-aldehyde resin particles, collecting a first portion of said solution exiting from said bed which contains a non-bitter fraction of said hydrolysate and thereafter collecting a second portion of said solution exiting from said bed which contains a bitter fraction of said hydrolysate.

4,075,196

PRODUCTION OF CASEIN AND CASEINATES

Ernest Badertscher, Orbe, and Michel Chaveron, Vevey, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed May 7, 1975, Ser. No. 575,207
Claims priority, application Switzerland, June 7, 1974, 7780/74
Int. Cl.[2] A23J 1/20
U.S. Cl. 260—120 14 Claims

1. A process for the continuous production of casein and caseinates, which comprises

destabilizing a colloidal solution with the composition of a skimmed milk and converting the solution into a mixture of curd and serum,

separating the curd from the serum,

introducing the curd in the form of grains into a stream of washing liquid,

passing the mixture of curd grains and washing liquid under turbulent conditions through a first tube,

separating the curd from the washing liquid and introducing the curd in the form of grains into a second stream of water,

thereafter introducing the mixture of curd grains and second stream of water under turbulent conditions into a second tube,

thereafter separating the curd from the water, and

using the water obtained from this separation as washing liquid in the first tube wherein the quantity of water used is from 0.2 to 0.4 liters per liter of colloidal solution treated.

4,075,197

SERUM ALBUMIN PRODUCTION

James M. Schuck, Chesterfield, and Charles Lewis, Jr., Hazelwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sept. 20, 1976, Ser. No. 724,438
Int. Cl.[2] C07G 7/00
U.S. Cl. 260—122 13 Claims

1. A method for the production of a serum albumin fraction in high yield and purity from admixture with other blood protein components comprising contacting the albumin-protein mixture with a resinous polymeric material selected from the group consisting of dilowerlalkylaminoloweralkyl-substituted cross-linked dextran polymers, heating at a temperature of from about 65° C to about 72° C and at a pH of from about 5.0 to about 5.5 for about one to about four hours and then adjusting the mixture to a pH of from about 3.5 to about 4.5 to selectively elute the desired albumin therefrom.

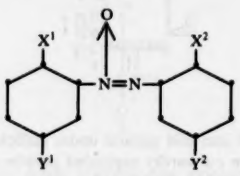
4,075,198

PROCESS FOR MANUFACTURE OF BENZIDINE PIGMENTS

Harald E. K. Gleinig, Bechen, Neschen, Germany, assignor to Colour-Chem Ltd., India

Filed Oct. 2, 1975, Ser. No. 618,886
Int. Cl.[2] C07C 109/04, 109/06; C09B 35/10, 35/18
U.S. Cl. 260—161 4 Claims

1. In the process of making a benzidine pigment by reducing an azoxybenzene to a hydrazobenzene, then subjecting the hydrazobenzene to benzidine rearrangement, diazotizing the resulting benzidine and coupling it to a benzidine pigment coupling component, the improvement according to which the azoxybenzene has the formula



in which X^1, X^2, Y^1 and Y^2 are selected from the class consisting of hydrogen, chlorine, methyl, methoxy, ethoxy, sulfo and carboxyl,

and the reduction to the corresponding hydrazobenzene is effected by technical NaHS in aqueous solution at a pH between about 8 and about 10, and at a temperature of 50° to 100° C, the solution is then cooled to precipitate out the hydrazobenzene, the precipitated hydrazobenzene is filtered off, washed, and in the resulting crude condition subjected to the benzidine rearrangement.

4,075,199

TERTIARY ALIPHATIC ALPHA-PEROXYAZO COMPOUNDS

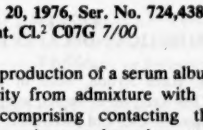
Ronald Edward MacLeay, Williamsville; Chester Stephen Sheppard, Tonawanda, and Harold Carl Lange, Grand Island, all of N.Y. assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 88,110, Nov. 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 725,180, April 29, 1968, abandoned, which is a continuation of Ser. No. 616,158, Feb. 15, 1967, abandoned, which is a continuation of Ser. No. 409,306, Nov. 5, 1964, abandoned. This application Dec. 19, 1973, Ser. No. 426,411
Int. Cl.[2] C07C 107/02; B01J 27/24; C08J 9/00; C08G 63/12
U.S. Cl. 260—192 8 Claims

1. An α-peroxyazo compound of the formula $(R'')_3C-N=N-C(R_1)(R_2)-OOR$ where:

$(R'')_3C$ is t-alkyl or t-aralkyl where the R''s are the same or different and are selected from alkyl of 1-5 carbons or phenyl, not more than one R'' being phenyl;

R is $-C(R'')_3$, $-C(R'_1)(R'_2)-N=N-C(R'')_3$ or



R, R'_1, R_2 and R'_2 are separately selected from alkyl of 1-5 carbons; alkyl of 1-5 carbons substituted with lower alkoxy, carboxy or lower alkoxycarbonyl; phenyl; or join with their common carbon atom to form cyclohexyl; and R_{13} is C_1—C_6 alkylene.

4,075,200
4(2'-NITRO-4'-SULFOANILINO) PHENYL AZO HYDROXYPHENYL DYES

Denis Robert Annesley Ridyard, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

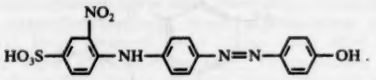
Continuation of Ser. No. 516,801, Oct. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 498,853, Aug. 19, 1974, abandoned, which is a division of Ser. No. 252,576, May 12, 1972, abandoned. This application Nov. 18, 1975, Ser. No. 632,980

Claims priority, application United Kingdom, May 17, 1971, 15272/71

Int. Cl.[2] C09B *29/12*

U.S. Cl. 260—206 10 Claims

1. A monoazo dyestuff having the formula



4,075,201
BIS CARBAMATE DERIVATIVES OF DIAZETIDINE DIONES

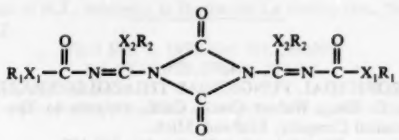
Julius Jakob Fuchs, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 603,651, Aug. 11, 1975, Pat. No. 4,045,473. This application Mar. 10, 1977, Ser. No. 776,258

Int. Cl.[2] C07D *229/00*

U.S. Cl. 260—239 A 6 Claims

1. A compound of the formula:



where

R_1 is alkyl of 1–3 carbon atoms;

R_2 is alkyl of 1–4 carbon atoms; and

X_1 and X_2 are independently selected from oxygen and sulfur.

4,075,202
S-TRIAZOLO-1,5-BENZODIAZPINE-4-ONES

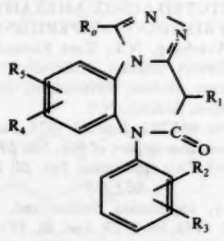
Robert Bruce Moffett, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 27, 1973, Ser. No. 401,220

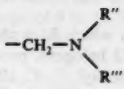
Int. Cl.[2] C07D *487/04*

U.S. Cl. 260—239.3 T 10 Claims

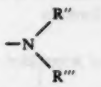
1. A compound of the formula IIIA



wherein R_0 is hydrogen, alkyl of 1 to 3 carbon atoms, inclusive, hydroxy, hydroxymethyl and



in which R'' and R''' are hydrogen, alkyl of 1 to 3 carbon atoms or together



is selected from the group consisting of pyrrolidino, piperidino, morpholino, and N-methylpiperazino; wherein R_1 is hydrogen or methyl and wherein R_2, R_3, R_4 and R_5 are selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms halogen, nitro, trifluoromethyl, alkoxy and alkylthio in which the carbon moieties of alkoxy and alkylthio have from 1 to 3 carbon atoms, inclusive, and the pharmacologically acceptable acid addition salts thereof.

4,075,203
PROCESS FOR PREPARING A 3-EXOMETHYLENECEPHAM SULFOXIDE FROM PENICILLIN SULFOXIDES

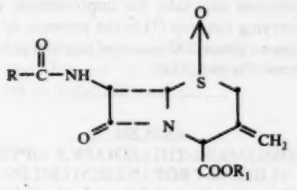
Ta-Sen Chou, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed June 16, 1976, Ser. No. 696,674

Int. Cl.[2] C07D *501/02*

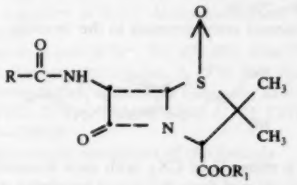
U.S. Cl. 544—18 19 Claims

1. In a process for preparing a 3-exomethylenecepham sulfoxide of the formula

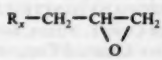


by

1. reacting a penicillin sulfoxide of the formula



with an N-chloro halogenating agent at a temperature of from about 75° C. to about 135° C. in an inert solvent under anhydrous conditions and in the presence of an amount of an epoxide sufficient at least to account for any hydrogen chloride which may be formed, said epoxide having the formula



in which R_x is hydrogen or methyl; and in which, in the above formulae, R_1 is a carboxylic acid protecting group; and R is

(a) hydrogen, C_1–C_3 alkyl, halomethyl, cyanomethyl, benzyloxy, 4nitrobenzyloxy, t-butyloxy, 2,2,2-trichloro-

ethoxy, 4-methoxybenzyloxy, 3-(2-chlorophenyl)-5-methylisoxazol-4-yl;

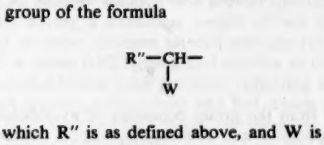
(b) the group R′ in which R′ is phenyl or phenyl substituted with 1 or 2 halogens, protected hydroxy, nitro, cyano, trifluoromethyl, C_1–C_4 alkyl, or C_1–C_4 alkoxy;

(c) a group of the formula R″-$(Q)_m$-CH_2- in which R″ is R′ as defined above, 1,4-cyclohexadienyl, 2-thienyl, or 3-thienyl; *m* is 0 or 1; and Q is O or S; subject to the limitation that when *m* is 1, R″ is R′; or

(d) a group of the formula

in which R″ is as defined above, and W is protected hydroxy or protected amino;

to produce a sulfinyl chloride of the formula



in which R and R_1 are as aforedefined;

(2) treating the resulting reaction mixture to remove said epoxide therefrom;

(3) filtering insolubles from the epoxide-free mixture; and

(4) treating said epoxide-free mixture with a Friedel-Crafts catalyst at a temperature of from about −20° C. to about +100° C. to produce the aforementioned 3-exomethylenecepham sulfoxide; the improvement which comprises carrying out step (1) in the presence of from about 100 grams to about 500 grams of calcium oxide per mole of the penicillin sulfoxide.

4,075,204

(1,3)DITHIOLO-(4,5-b)THIAZOLO(4′,5′-e)PYRAZIN-2-YLIDENE-PROPANEDINITRILES

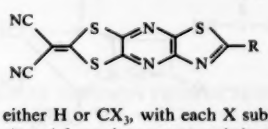
Charles A. Wilson, and Craig E. Mixan, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 23, 1977, Ser. No. 773,861

Int. Cl.² C07D *513/14*

U.S. Cl. 260—250 BC **4 Claims**

1. A compound corresponding to the formula



wherein R is either H or CX_3, with each X substituent being individually selected from the group consisting of H and X′, wherein X′ is either F or Cl.

4,075,205

(1,3-DITHIOLO-(4,5-b)(1,2,5)THIADIAZOLO(3′,4′-e)PYRAZIN-6-YLIDENE)-PROPANEDINITRILE

Charles A. Wilson, and Craig E. Mixan, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 22, 1977, Ser. No. 770,716

Int. Cl.² C07D *513/14*

U.S. Cl. 260—250 BC **1 Claim**

1. The compound (1,3-Dithiolo(4,5-b)(1,2,5)-thiadiazolo(3′,4′-e)pyrazin-6-ylidene)-propanedinitrile.

4,075,206

SUBSTITUTED PYRROLOQUINOXALINONES AND DIONES

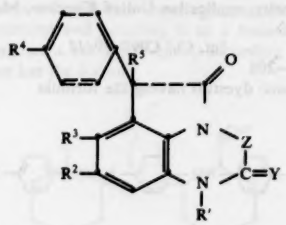
Richard E. Holmes, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 25, 1977, Ser. No. 772,154

Int. Cl.² A61K *31/33*; C07D *487/04*

U.S. Cl. 260—250 BC **8 Claims**

1. A compound of the formula:



wherein

R′ is H or C_1–C_3 alkyl;

when taken singly, R^2 is H, C_1–C_3 alkyl, C_1–C_3 alkoxy, or Cl and R^3 is H; and

R^2 and R^3 when taken together with the carbon atoms to which they are attached form a benzene ring;

R^4 is H, Cl or F;

R^5 is OH, H or phenyl;

Y is O or H_2;

Z is —CH_2—CH_2—or —CHR^6— wherein R^6 is H or C_1–C_3 alkyl.

4,075,207

MICROBICIDAL/FUNGICIDAL THIAZOLOPYRAZINES

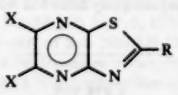
Yulan C. Tong, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 17, 1977, Ser. No. 769,487

Int. Cl.² C07D *513/04*; A01N *9/14*

U.S. Cl. 260—250 BC **10 Claims**

1. A compound of the formula



wherein, X, independently in each occurrence, is Br, Cl or F, R is H or $CH_{3-x}Y_x$, Y is Br, Cl or F, independently in each occurrence, and *x* is 0, 1, 2 or 3.

4,075,208

1-SUBSTITUTED-4-(2-OXO-HEXAHYDRO-1-PYRIMIDINYL)-PIPERIDINE

Max Wilhelm, Watchung, N.J.; Kurt Eichenberger, Therwil, Switzerland; Herbert Schröter, Fullinsdorf, Switzerland, and Franz Ostermayer, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

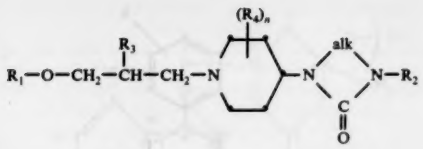
Division of Ser. No. 483,742, June 27, 1974, Pat. No. 3,956,335, which is a continuation-in-part of Ser. No. 389,106, Aug. 16, 1973, abandoned. This application Jan. 28, 1976, Ser. No. 652,965

Claims priority, application Switzerland, Aug. 24, 1972, 12539/72; July 3, 1973, 9670/73; Apr. 30, 1974, 5907/74

Int. Cl.² A61K *31/505*; C07D *401/04*

U.S. Cl. 260—256.4 C **8 Claims**

1. A piperidine compound having the formula



wherein R_1 is phenyl, naphthyl, 5,6,7-tetrahydro-1-naphthyl or 5,6,7,8-tetrahydro-2-naphthyl, or phenyl, naphthyl, 5,6,7-tetrahydro-1-naphthyl or 5,6,7-tetrahydro-2-naphthyl which are monosubstituted or disubstituted by lower alkyl, lower alkoxy, lower alkenyl, lower alkenyloxy, halogen, halogen-lower alkyl, carbamoyl, lower alkyl-substituted carbamoyl, lower alkoxycarbonylamino-lower alkyl, lower alkoxy-lower alkoxy, lower alkanoylaminoethenyl, lower akylthio-lower alkoxy, hydroxyl, lower alkanoyl, lower alkoxy-lower alkyl, lower alkynyl, lower alkylthio-lower alkyl, hydroxy-lower alkyl, lower alkanoyloxy, lower alkylthio, lower alkanoyl amino, cyano, amino, nitro, ureido, lower alkylated ureido, phenyl-lower alkoxy, and/or lower alkynyloxy, R_2 is hydrogen, lower alkyl, lower alkenyl, α-phenyl-lower alkyl or lower alkanoyl, R_3 is hydroxyl, a lower alkanoyloxy or a lower alkoxy, R_4 is hydrogen or lower alkyl, n is an integer from 0 to 4, and alk is trimethylene or mono-lower alkylated trimethylene or a therapeutically acceptable salt thereof.

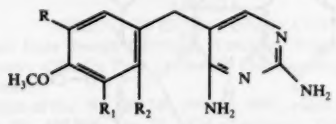
4,075,209
PROCESS FOR PREPARING SUBSTITUTED 2,4-DIAMINOPYRIMIDINES AND ISOXAZOLE INTERMEDIATE

Jane Liu Jernow, Verona, and Perry Rosen, North Caldwell, both of N.J., assignors to Hoffmann-La Roche, Inc., Nutley, N.J.

Filed Feb. 7, 1977, Ser. No. 766,094
Int. Cl.[2] C07D *239/48, 261/08*
U.S. Cl. 260—256.4 N **7 Claims**

1. A process for preparing a compound of the formula

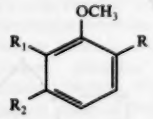
I



wherein R, R_1 and R_2 are hydrogen, lower alkoxy and lower alkyl,

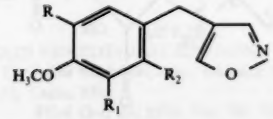
which comprises the steps of (a) reacting 4-bromomethylisoxazole with the corresponding aromatic compound of the formula

II



wherein R, R_1 and R_2 are as described above, to yield a compound of the formula

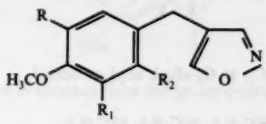
III



wherein R, R_1 and R_2 are as described above, and subsequently (b) separating and treating the reaction product of step (a) with a guanidine salt, whose ½ M aqueous solution has a pH in the range of 9 to 12.

3. A compound of the formula

III



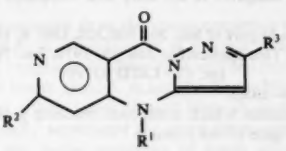
wherein R, R_1 and R_2 are hydrogen, lower alkoxy and lower alkyl.

4,075,210
PYRAZOLO[1,5-a]PYRIDO[4,3-d]PYRIMIDIN-9(4H)-ONE AND DERIVATIVES THEREOF

Theodor Denzel, Regensberg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 31, 1977, Ser. No. 783,252
Int. Cl.[2] A61K *31/415;* C07D *471/04*
U.S. Cl. 260—256.4 F **16 Claims**

1. A compound of the formula



wherein

R^1 and R^3 each is hydrogen or lower alkyl; and

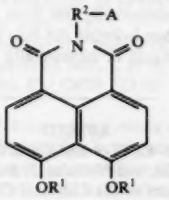
R^2 is hydrogen, halogen, lower alkylthio, lower alkoxy or lower alkylamino.

4,075,211
NAPHTHALIMIDE COMPOUNDS AND OPTICAL BRIGHTENERS

Horst Scheuermann, and Albert Hettche, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation-in-part of Ser. No. 479,892, June 17, 1974, abandoned. This application Jan. 2, 1976, Ser. No. 646,181
Claims priority, application Germany, 2331307
Int. Cl.[2] C07D *221/14, 401/06;* C09K *11/06;* C07D *413/06*
U.S. Cl. 260—270 H **9 Claims**

1. A naphthalimide compound of the formula

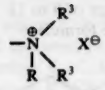


in which

R^1 is C_1- to C_4-alkyl or C_1- to C_4-alkoxyethyl,

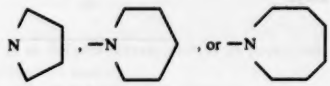
R^2 is branched C_3- to C_6-alkylene,

A is



R is hydrogen, C_1- to C_4-alkyl, allyl or benzyl,

$N-R^3$ is $N(CH_3)_2$, $N(C_2H_5)_2$, $N(C_3H_7)_2$, $N(C_4H_9)_2$,



and

X^- is an unreactive and colorless anion.

4,075,212

METHOD OF PREPARING 8,8-DISUBSTITUTED-6-METHYLERGOLINES AND RELATED COMPOUNDS

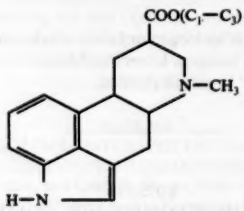
Nicholas J. Bach, and Edmund C. Kornfeld, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 530,320, Dec. 6, 1974, Pat. No. 3,968,111. This application Jan. 19, 1976, Ser. No. 650,582

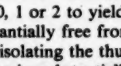
Int. Cl.² C07D *457/04*

U.S. Cl. 260—285.5 **1 Claim**

1. The process which comprises reacting a (C_1–C_3) alkyl dihydrolysergate of the formula



with at least 2 moles of non-hydrolytic base of the class consisting of lithium tetramethylpiperidide and potassium diisopropyl amide in an inert solvent to form a 1,8-dianion of the said (C_1–C_3) alkyl dihydrolysergate, and then reacting said dianion with not more than one mole of an alkylating agent, $R''''(CH_2)_n X$ wherein R'''' is CH_3, CH_2, CN or



X is halogen and *n* is 0, 1 or 2 to yield a (C_1–C_3) alkyl 8-R'''' dihydrolysergate substantially free from any 1,8-di R'''' dihydrolysergate and then isolating the thus formed (C_1–C_3) alkyl 8-R'''' dihydrolysergate in substantially pure form from the reaction mixture.

4,075,213

8-ARYL-9-ERGOLENES

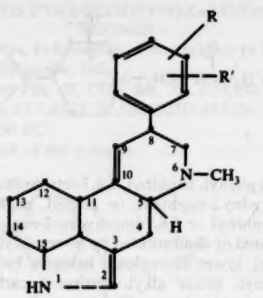
Edmund C. Kornfeld, and Nicholas J. Bach, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 2, 1977, Ser. No. 773,627

Int. Cl.² C07D *457/02*; A61K *31/48*

U.S. Cl. 260—285.5 **11 Claims**

1. A compound of the formula:



wherein R and R', when taken individually are hydrogen or ortho or para Cl, C_1–C_2 alkyl, or C_1–C_2 alkoxy and when taken together on adjacent carbons of the phenyl ring, are methylene dioxy; and pharmaceutically acceptable acid addition salts thereof formed with non-toxic acids.

4,075,214

PREPARATION OF LEUROSIDINE AND NOVEL LEUROSIDINE 4'-ETHERS AND ESTERS

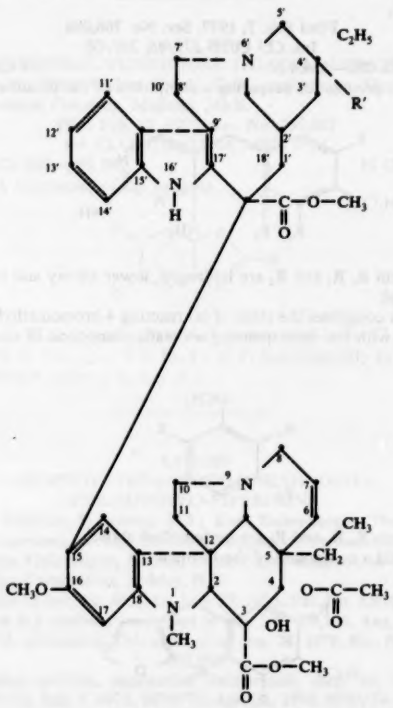
Allen S. Katner; Gerald E. Gutowski, and Jean C. Miller, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 17, 1976, Ser. No. 687,274

Int. Cl.² C07D *471/18*

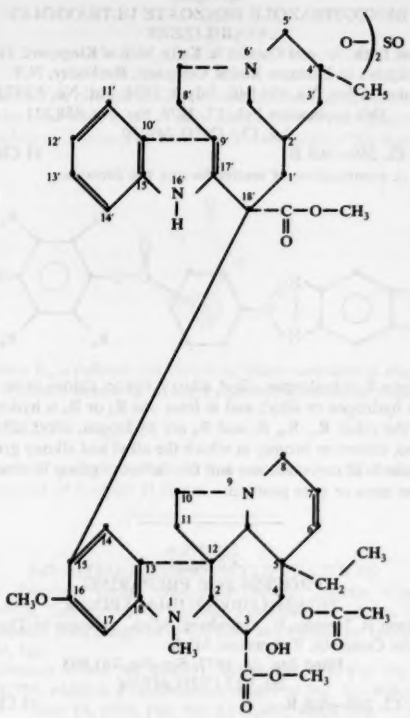
U.S. Cl. 260—287 B **5 Claims**

1. A compound of the formula



wherein R' is methoxy, ethoxy, propoxy or an azide group.

5. VLB 4'-bis-sulfite ester of the formula



4,075,215
THIENO-PYRIDINE DERIVATIVES

Albert Rene Joseph Castaigne, Toulouse, France, assignor to Centre d'Etudes Pour l'Industrie Pharmaceutique, Toulouse, France

Division of Ser. No. 660,248, Feb. 20, 1976, which is a division of Ser. No. 435,036, Jan. 21, 1974, abandoned. This application Aug. 18, 1976, Ser. No. 715,579

Claims priority, application France, Feb. 1, 1973, 73.03503

Int. Cl.[2] C07D *417/02*

U.S. Cl. 260—294.8 C **5 Claims**

1. A compound selected from the group consisting of 5-phenacyl-thieno[3,2-c]pyridinium bromide, 5-(o-methoxyphenacyl)-thieno[3,2-c]pyridinium bromide, 2-chloro-5-phenacyl-thieno[3,2-c]pyridinium bromide, N-parachlorophenacyl-thieno[3,2-c]pyridinium bromide, 5-(3,4-dihydroxyphenacyl)-thieno[3,2-c]pyridinium chloride, 5-para-fluorophenacyl-thieno[3,2-c]pyridinium chloride, N-(para-hydroxyphenacyl)-thieno[3,2-c]pyridinium chloride, N-(para-methoxyphenacyl)-thieno[3,2-c]pyridinium bromide and N-(meta-methoxyphenacyl)-thieno[3,2-c]pyridinium bromide.

4,075,216
CERTAIN BENZOTHIAZOLIN-2-ONE DERIVATIVES

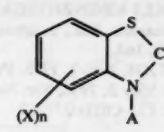
John J. D'Amico, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 26, 1976, Ser. No. 735,658

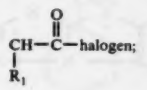
Int. Cl.[2] C07D *277/68;* A01N *9/12*

U.S. Cl. 260—294.8 C **22 Claims**

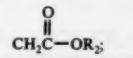
1. A compound having the formula



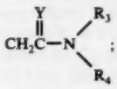
wherein A is selected from the group consisting of



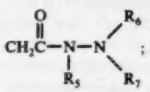
(I)



(II)



(III)



(IV)

wherein R_1 is selected from the group consisting of hydrogen and lower alkyl; X is halogen; Y is selected from the group consisting of oxygen and sulfur; R_2 is selected from the group consisting of lower alkenyl, monohalo lower alkenyl, dihalo lower alkenyl, trihalo lower alkenyl, lowe alkynyl, benzyl and benzyl optionally substituted by up to three substituents selected from the group consisting of lower alkyl, trifluoromethyl and halogen; R_3 is selected from the group consisting of hydrogen, lower alkenyl, lower alkynyl, pyridyl and pyridyl substituted by halogen; R_4 is selected from the group consisting of hydrogen and lower alkenyl; R_5 is selected from the group consisting of hydrogen and lower alkyl; R_6 and R_7 are independently selected from the group consisting of hydrogen, phenyl and lower alkyl; n is 0 or 1; provided that R_3 and R_4 may both be hydrogen only when Y is sulfur; further provided that R_6 may not be hydrogen when R_7 is hydrogen.

4,075,217
CONVERSION OF 3-(PYRIDINYL)-2-CYCLOHEXEN-1-ONE TO 3-(PYRIDINYL)ANILINES

Karl O. Gelotte, Nassau; Andrew W. Zalay, Albany, and Malcolm R. Bell, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 668,451, March 19, 1976, Pat. No. 4,026,900. This application Nov. 1, 1976, Ser. No. 737,392

Int. Cl.[2] C07D *213/02*

U.S. Cl. 260—296 R **3 Claims**

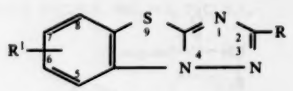
1. The process which comprises heating at about 80° to 140° C. a solution containing 3-PY-2-cyclohexen-1-one oxime, a lower-alkanoic acid and a lower-alkanoic anhydride while passing hydrogen chloride gas through the reaction mixture to produce N-(lower-alkanoyl)-3-PY-aniline and hydrolyzing said N-(lower-alkanoyl) compound under aqueous alkaline or acidic conditions at about 80° to 150° C. to produce the corresponding 3-PY-aniline where PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

4,075,218
s-TRIAZOLO[5,1-b]BENZOTHIAZOLES

Charles J. Paget, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 547,828, Feb. 7, 1975, Pat. No. 3,974,286.
This application May 3, 1976, Ser. No. 682,007
Int. Cl.[2] C07D *277/82*
U.S. Cl. 260—305 9 Claims

1. A compound of the formula



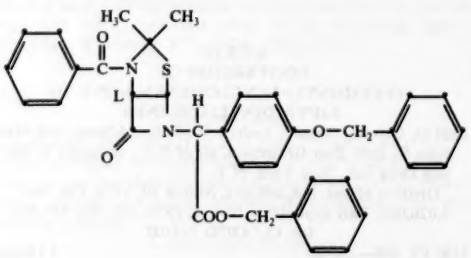
wherein R represents
hydrogen,
hydroxy,
trifluoromethyl,
methyl, or
ethyl;
R^1 represents
hydrogen,
methyl,
ethyl,
chloro,
propyl,
fluoro,
isopropyl,
bromo, or
methoxy;
provided that when R represents ethyl or trifluoromethyl, R^1 represents methyl or ethyl; and provided that methoxy, propyl and isopropyl R^1 groups occupy only the 5-position.

4,075,219
EPIMERIZATION PROCESS

Lawrence J. McShane, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 31, 1977, Ser. No. 783,123
Int. Cl.[2] C07D *513/04*
U.S. Cl. 260—306.7 C 4 Claims

1. The process for preparing in the D-configuration the compound of the formula



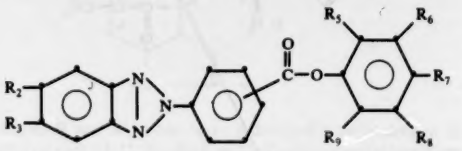
which comprises dissolving at a temperature between about 20° C. and about 30° C. said compound in the L-configuration or said compound as a mixture of the L- and D-configurations in pyridine to a concentration between about 50 mg./ml. to about 100 mg./ml.; diluting said solution with water in an amount corresponding to between about 10 percent and about 50 percent by volume; and separating said compound in the D-configuration.

4,075,220
BENZOTRIAZOLE BENZOATE ULTRAVIOLET STABILIZERS

Gether Irick, Jr., and Charles A. Kelly, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 484,848, July 1, 1974, Pat. No. 3,957,813.
This application Feb. 17, 1976, Ser. No. 658,311
Int. Cl.[2] C07D *249/20*
U.S. Cl. 260—308 B 11 Claims

1. A composition of matter having the formula:



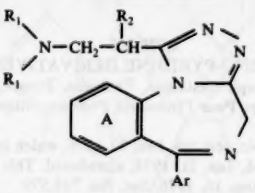
wherein R_2 is hydrogen, alkyl, alkoxy, cyano, chloro or bromo; R_3 is hydrogen or alkyl; and at least one R_5 or R_9 is hydrogen and the other R_5, R_6, R_7 and R_8 are hydrogen, alkyl, alkoxy, cyano, chloro or bromo; in which the alkyl and alkoxy groups contain 1–20 carbon atoms and the carbonyl group is attached at the meta or para position.

4,075,221
PROCESS FOR PREPARING TRIAZOLOBENZODIAZEPINES

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

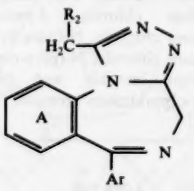
Filed Jan. 24, 1977, Ser. No. 761,803
Int. Cl.[2] C07D *487/04*
U.S. Cl. 260—308 R 14 Claims

1. An improved process for the production of compounds of the formula II:



II

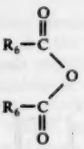
wherein R_1 is alkyl of 1 to 3 carbon atoms, inclusive; wherein R_2 is hydrogen, methyl or phenyl; wherein the ring A is unsubstituted, or monosubstituted with fluoro, chloro, bromo, nitro, trifluoromethyl, or methylthio; and wherein Ar is phenyl; o-chlorophenyl; o-fluorophenyl; 2,6-difluorophenyl or 2-pyridyl, which comprises reacting a compound of the formula I:



I

wherein ring A, Ar and R_2 are defined as above, with a dialkylmethyleneammonium salt wherein alkyl is of 1 to 3 carbon atoms, inclusive, in the presence of 0.05 to 0.5 moles of an acylating agent per 1 mole of the dialkylmethyleneammonium salt in which the acylating agent is selected from the group consisting of

wherein R_4 is phenyl, or alkyl of 1 to 5 carbon atoms, inclusive, in which the alkyl moiety can be chlorinated or fluorinated and Y is chloro or bromo, or with an acid anhydride of the formula:



wherein R_6 is defined as a chloro or fluoro-substituted alkyl of 1 to 5 carbon atoms, or an alkyl chloroformate of the formula:

ClCOOR'

wherein R' is a lower alkyl of 1 to 4 carbon atoms, to obtain the compound of formula II above.

4,075,222
3-(5-NITRO-2-IMIDAZOLYL)PYRAZOLES

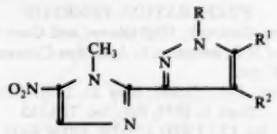
John Pomfret Verge, Henley-on-Thames; Martin Charles Neville, Tadley, both of England, and Henry Friedman, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 558,591, March 14, 1975, Pat. No. 3,980,794, which is a continuation-in-part of Ser. No. 469,176, May 13, 1974, Pat. No. 3,947,467, which is a continuation-in-part of Ser. No. 385,136, Aug. 2, 1973, abandoned. This application May 6, 1976, Ser. No. 683,985

Int. Cl.[2] **C07D** *233/92;* **A01N** *9/22*

U.S. Cl. 548—336 **8 Claims**

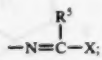
1. A compound of the formula



wherein

R is C_1–C_3 alkyl, halo(C_1–C_3)alkyl, or hydroxy(C_1–C_3)alkyl;

R^1 is



R^2 is cyano;

R^5 is hydrogen or C_1–C_3 alkyl;

X is OR^7; and

R^7 is C_1–C_8 alkyl, C_2–C_5 alkenyl, or halo(C_1–C_3)-alkyl.

4,075,223
NOVEL ANTIFERTILITY AGENTS

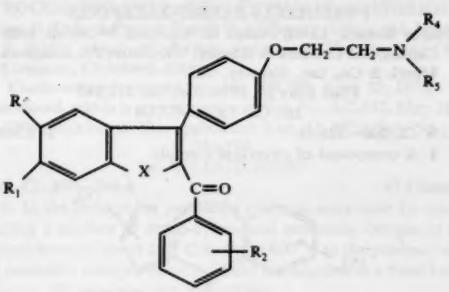
Tulio Suarez, and C. David Jones, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 625,992, Oct. 28, 1975, Pat. No. 4,017,546. This application Nov. 24, 1976, Ser. No. 744,488

Int. Cl.[2] **C07D** *295/10*

U.S. Cl. 260—326.5 C **18 Claims**

1. A compound of the formula



in which X is $—CH_2—$, $—CH_2—CH_2—$ or —CH=CH—; R and R_1 independently are hydrogen, hydroxyl, C_1- to C_5-alkoxy, or C_5- to C_6-cycloalkoxy; subject to the limitation that at least one of R and R_1 is hydrogen; R_2 is hydrogen, chloro, bromo, hydroxyl, C_1- to C_5-alkoxy, or C_5- to C_6-cycloalkoxy; subject to the limitation that at least one of R, R_1, or R_2 is other than hydrogen; and R_4 and R_5 independently are C_1-C_4 alkyl, or R_4 and R_5 taken together with the nitrogen to which they are bonded constitute a heterocyclic ring selected from the group consisting of pyrrolidino, piperidino, hexamethyleneimino, or morpholino; and pharmaceutically acceptable non-toxic acid addition salts thereof.

4,075,224
3,5-BIS (INDOLYL)-5-(INDOLYL)-2(5H)-FURANONES

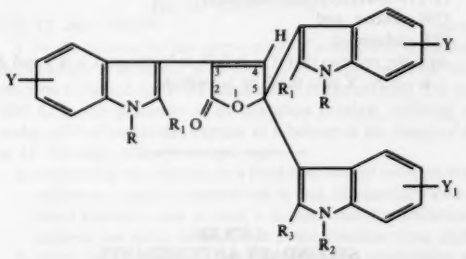
Nathan Norman Crounse, Cincinnati, and Paul Joseph Schmidt, Sharonville, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Filed Jan. 22, 1976, Ser. No. 651,607

Int. Cl.[2] **C07D** *209/18, 209/20*

U.S. Cl. 260—326.14 R **20 Claims**

1. A 3,5-bis(1-R-2-R_1-5/6-Y-3-indolyl)-5-(1-R_2-2-R_3-5/6-Y_1-3-indolyl)-2(5H)-furanone having the formula



wherein:

R and R_2 represent hydrogen, non-tertiary alkyl of one to eight carbon atoms, alkenyl of two to four carbon atoms, benzyl or benzyl substituted in the benzene ring by one or two of halo or alkyl of one to three carbon atoms;

R_1 and R_3 represent hydrogen, alkyl of one to three carbon atoms or phenyl; and

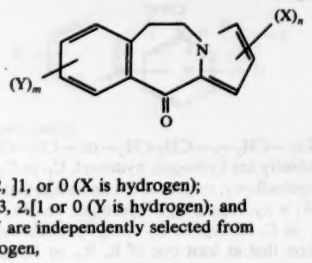
Y and Y_1 represent one or two of hydrogen, alkyl of one to three carbon atoms, alkoxy of one to three carbon atoms, halo or nitro.

4,075,225
PYRROLO[2,1-B][3]BENZAZEPINES

Joshua Rokach, Laval; Joseph G. Atkinson, Montreal, both of Canada, and Clarence S. Rooney, Worcester, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed June 29, 1976, Ser. No. 701,047
Int. Cl.[2] C07D *487/04*
U.S. Cl. 260—326.31 18 Claims

1. A compound of structural formula:



wherein
n is [3, 2,]1, or 0 (X is hydrogen);
m is [4, 3, 2,[1 or 0 (Y is hydrogen); and
X and Y are independently selected from
(1) hydrogen,
(2) halo,
(3) formyl,
(4) lower alkanoyl,
(5) lower alkyl,
(6) lower alkoxycarbonyl,
(7) hydroxy-lower alkyl,
(8) perhalo-lower alkyl,
(9) lower alkoxy,
(10) cyano,
(11) perhalo-lower alkylthio,
(12) lower alkylthio,
(13) lower alkylsulfonyl,
(14) perhalo-lower alkylsulfonyl,
(15) lower alkylsulfinyl,
(16) perhalo-alkylsulfinyl,
(17) amino,
(18) lower alkanoylamino,
(19) lower alkylamino,
(20)di(lower alkyl)amino,
(21) hydroxy,
(22) N-lower alkylcarbamoyl,
(23) N,N-di(lower alkyl)carbamoyl,
(24) nitro,
(25) di(lower alkyl)sulfamoyl,
(26) lower alkoxycarbonylamino,
(27) N-loweralkyl-carbamoyloxy,
(28) carboxy, and
(29) carbamoyl;
with the proviso that if *m* is 0 (Y is hydrogen), *n* is 1 and X is —CN, X is in the 2 or 3-position.

4,075,226
SECONDARY ANTIOXIDANTS

Charles H. Foster, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 11, 1977, Ser. No. 777,236
Int. Cl.[2] C07D *335/04, 497/20*
U.S. Cl. 260—327 TH 3 Claims

1. Decahydro-3,3,8,8-tetramethoxy-2,7-epithio-1,4-ethanonaphthalene-5,9-dione.

2. Decahydro-3,3,8,8-tetraethoxy-2,7-epithio-1,4-ethanonaphthalene-5,9-dione.

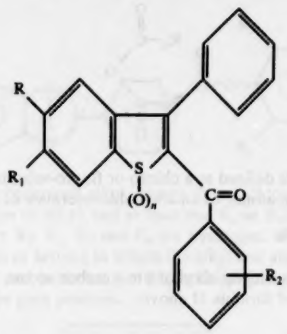
3. Decahydro-dispiro[1,3-dioxolane-2,3'-(2',7'-epithio-1',4'-ethanonaphthalene)-8',2''-[1,3]dioxolane]-5',9'-dione.

4,075,227
ANTIFERTILITY COMPOUNDS

C. David Jones, and Tulio Suarez, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 626,009, Oct. 28, 1975, abandoned. This application Nov. 22, 1976, Ser. No. 743,819
Int. Cl.[2] C07D *333/56, 333/64*
U.S. Cl. 260—330.5 8 Claims

1. A compound of the formula



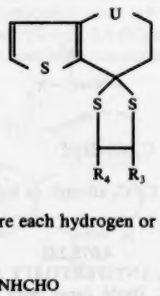
in which *n* is 0 or 1; R and R_1 independently are hydrogen, hydroxyl, C_1- to C_5-alkoxy, or C_5- to C_6-cycloalkoxy; subject to the limitation that at least one of R and R_1 is hydrogen; R_2 is hydrogen, chloro, bromo, hydroxyl, C_1- to C_5-alkoxy, or C_5- to C_6-cycloalkoxy; subject to the limitation that at least one of R, R_1, or R_2 is other than hydrogen.

4,075,228
1,3-DITHIOLANE COMPOUNDS AND METHOD OF PREPARATION THEREOF

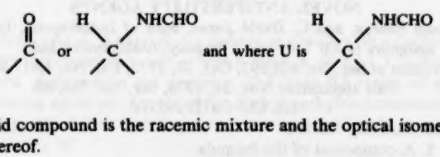
William Henry Gastrock, Hightstown, and Goro Asato, Titusville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 799,887, May 23, 1977. This application Sept. 2, 1976, Ser. No. 720,163
Int. Cl.[2] C07D *333/16;* A01N *9/00*
U.S. Cl. 260—332.3 P 3 Claims

1. A 1,3-dithiolane compound of formula:



wherein R_3 and R_4 are each hydrogen or methyl; and U is the substituent



said compound is the racemic mixture and the optical isomers thereof.

4,075,229
PROCESS FOR STABILIZING METALDEHYDE AND STABILIZED COMPOSITION

Beat Oehrli, Visp; Max Mettler, Ried near Brig, and Bruno Righetti, Naters, all of Switzerland, assignors to Lonza, Ltd., Gampel, Switzerland

Filed July 19, 1976, Ser. No. 706,272
Claims priority, application Switzerland, July 18, 1975, 009416/75
Int. Cl.² C07D *323/04*
U.S. Cl. 260—340 4 Claims

1. A process for stabilizing metaldehyde, which comprises mixing said metaldehyde and 0.005 to 5 percent by weight, based on the weight of said metaldehyde, of nicotinic acid amide, stabilizing said metaldehyde.

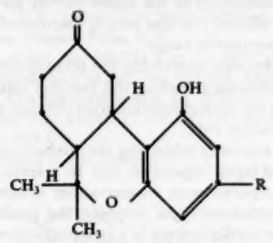
3. Stabilized metaldehyde which comprises metaldehyde and 0.005 to 5 percent by weight, based on the weight of said metaldehyde, of nicotinic acid amide, said nicotinic acid amide stabilizing said metaldehyde.

4,075,230
PREPARATION OF OPTICALLY ACTIVE TRANS-HEXAHYDRODIBENZOPYRANONES

Robert A. Archer, and William A. Day, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

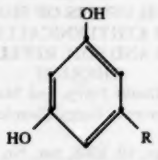
Filed Nov. 10, 1976, Ser. No. 740,507
Int. Cl.² C07D *311/78*
U.S. Cl. 260—345.3 9 Claims

1. A process for preparing an optically active trans-1-hydroxy-3-substituted-6,6-dimethyl-6,6a,7,8,10,10a-hexahydro-9H-dibenzo[b,d]pyran-9-one having the formula



wherein:

R is C_5–C_{10} alkyl, C_5–C_{10} alkenyl, C_5–C_8 cycloalkyl, and C_5–C_8 cycloalkenyl, comprising reacting an optically active isomer of apoverbenone with a 5-substituted resorcinol of the forumula



in the presence of aluminum chloride in an unreactive organic solvent.

4,075,231
PROCESS FOR PREPARING PHTHALIC ANHYDRIDE

Serge R. Dolhyj, Parma; Ernest C. Milberger, Solon, and James F. White, Akron, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 572,260, April 28, 1975, abandoned, which is a continuation of Ser. No. 362,412, May 21, 1973, abandoned. This application Nov. 12, 1976, Ser. No. 741,174
Int. Cl.² C07D *307/89*
U.S. Cl. 260—346.4 17 Claims

1. In the process for preparing phthalic anhydride by contacting a mixture of ortho-xylene and molecular oxygen at a temperature of about 200° C to about 600° C in the presence of an oxidation catalyst which is useful for reaction in a fixed-bed reactor, the improvement comprising:

using an oxidation catalyst consisting of

a. an essentially inert, porous support having a particle size of at least 20 microns, said inert support having an outer surface; and

b. a coating of a catalytically active material on said outer surface of said support which strongly adheres to said outer surface of said inert support, wherein said catalytically active material contains:

$$A_aD_bV_{12}O_x$$

wherein

A is Fe, Cr, Ni, Co, Mn, Cu, Ag, Bi, Zn, Mo, W or mixture thereof;

D is B, Sb or mixture thereof;

a is a number from greater than 0 to 5;

b is a number from greater than 0 to 10; and

x is the number of oxygens required to satisfy the valence requirements of the other elements present; wherein the weight of vanadium is less than 10% of the total weight of the oxidation catalyst.

4,075,232
PREPARATION OF MALEIC ANHYDRIDE FROM N-BUTENE IN A ONE-REACTOR, FLUID-BED SYSTEM USING TWO DIFFERENT CATALYSTS

Robert J. Zagata, Seven Hills, and Ernest C. Milberger, Solon, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Mar. 6, 1975, Ser. No. 556,092
Int. Cl.² C07D *307/60*
U.S. Cl. 260—346.75 10 Claims

1. In the process for the preparation of maleic anhydride by the reaction of n-butene with molecular oxygen wherein the reaction is carried out in the temperature range of about 200° to 600° C in the presence of an oxidation catalyst, utilizing a molar ratio of molecular oxygen to n-butene in the range of 4 to 12, the improvement comprising:

a. conducting the reaction in a fluid-bed reactor wherein the oxidation catalyst is maintained in one, substantially undivided reaction zone in such a manner that the oxidation catalyst can move to any point in the reaction zone; and

b. using as the oxidation catalyst a catalyst comprising a physical mixture of separate particles of first catalyst and separate particles of second catalyst—the first catalyst being one that is especially effective for the oxidation of n-butene to butadiene said first catalyst containing the oxides of at least molybdenum and bismuth, and the second catalyst being one that is especially effective for the oxidation of butadiene to maleic anhydride, said second catalyst containing molybdenum oxide and at least one other metal oxide selected from the group consisting of tungsten, antimony and vanadium.

4,075,233

16-DEHYDRO STEROIDS OF THE ANDROSTANE SERIES

Arthur Friedrich Marx, Delft, and Nicolaas Cornelis Maria Emanuel Barendse, Den Hoorn, both of Netherlands, assignors to Gist-Brocades N.V., Netherlands

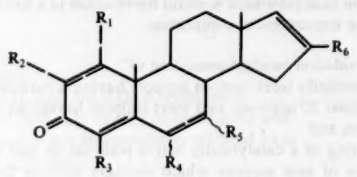
Filed July 15, 1976, Ser. No. 705,446

Claims priority, application United Kingdom, July 16, 1975, 29898/75

Int. Cl.[2] C07J *1/00*

U.S. Cl. 260—397.3 44 Claims

1. 16-Dehydro-androstane derivatives of the general formula:



I

wherein R_1, R_2 and R_5 each represent a hydrogen atom or a methyl group or R_1 and R_2 together represent a methylene group, R_3 represents a hydrogen or halogen atom or a hydroxyl or methyl group, R_4 represents a hydrogen or halogen atom or a methyl group or R_4 together with R_5 represent a methylene group, R_6 represents a hydrogen atom or an alkyl group having 1 to 3 carbon atoms, the dotted lines between the 1 - 2 and the 6 - 7 positions indicate the optional presence of one or two additional double bonds, but when all the symbols R represent a hydrogen atom there is at least one double bond in one of these positions, and the waved lines in the positions 6 and 7 indicate that R_4 and R_5 each are either in α- or β-position.

4,075,234

HYDRATED SOAP MAKING

Donald John Peterson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 12, 1976, Ser. No. 731,163

Int. Cl.[2] C11C *1/04;* C11D *13/00;* C11C *1/08;* C10M *1/24*

U.S. Cl. 260—417 15 Claims

1. A process for preparing the sodium or lithium salts of organic carboxylic acids which comprises saponifying the corresponding organic carboxylic acid ester with a concentrated aqueous solution of sodium hydroxide or lithium hydroxide in a liquid reaction medium comprising an alkyl nitrile, separating said salts from the reaction mixture, and removing excess alkyl nitrile from the salts.

4,075,235

N-ARYL-UREA COMPOUNDS AND HERBICIDAL COMPOSITIONS

Engelbert Kuhle, Berg.Gladbach; Erich Klauke, Odenthal-Hahnenberg, and Ludwig Eue, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 5, 1973, Ser. No. 376,865

Claims priority, application Germany, July 14, 1972, 2234586

Int. Cl.[2] C07C *119/00*

U.S. Cl. 260—453 RW 1 Claim

1. N-Aryl-urea compound designated N-(3-chloro-4-difluorochloromethylmercaptophenyl)-N'-methyl-N'-methoxyurea.

4,075,236

CONTINUOUS MANUFACTURE OF PEROXYESTERS

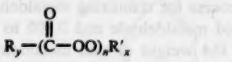
Uday Dakornath Wagle, Grand Island, and Venkatram Ramdas, Tonawanda, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Sept. 30, 1976, Ser. No. 728,349

Int. Cl.[2] C07C *179/18*

U.S. Cl. 260—453 RZ 9 Claims

1. A process for the continuous manufacture of a peroxyester having the formula



wherein:

(a) *x*, *y*, and *n* are 1 or 2;

(b) when *x* is 2, *y* is 1 and *n* is 2;

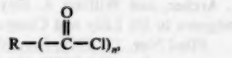
(c) when *y* is 2, *x* is 1 and *n* is 2;

(d) when *x*, *y* and *n* are 1, R is selected from the group consisting of a primary, secondary, or tertiary alkyl of 1 to 17 carbons, aryl of 6 to 14 carbons, and cycloalkyl of 3 to 12 carbons, and R' is selected from the group consisting of a tertiary alkyl of 4 to 12 carbons, a tertiary aralkyl of 9 to 18 carbons, and tertiary cycloalkyl of 6 to 12 carbons;

(e) when *x* is 2, R is a diradical selected from alkylene of 1 to 16 carbons, arylene of 6 to 14 carbons, cycloalkylene of 3 to 12 carbons, and aralkylene of 7 to 18 carbons; and

(f) when *y* is 2, R' is a di-tertiary diradical selected from alkylene of 6 to 16 carbons, aralkylene of 12 to 18 carbons, and cycloalkylene of 7 to 12 carbons; which comprises:

(I) continuously reacting an acid chloride having the formula



a hydroperoxide having the formula $R'(OOH)_n$, and an aqueous alkali metal hydroxide in two reaction zones of intense mixing connected in series in a temperature range of about $-10°$ to $+50°$ C and a pH of 10 to 14, wherein the first reaction zone is maintained in the upper part of the temperature range and the second reaction zone is maintained in the lower part of the temperature range;

(II) continuously recovering the peroxyester product by

(i) continuously feeding the reaction mixture directly from the second reaction zone through a liquid-liquid separation unit;

(ii) continuously subjecting the product stream from the liquid-liquid separation unit to a series of washings and separations in a mixer-settler system; and

(iii) continuously gas stripping the product from the mixer-settler system in a stripping column; and

(iv) continuously adding the acid chloride, hydroperoxide and aqueous alkali metal hydroxide to the first reaction zone to replace that used up in the reaction effluent.

4,075,237

PERFLUORINATED ESTERS OF FUMARIC ACID AND CERTAIN OTHER ETHYLENICALLY UNSATURATED POLY-BASIC ACID AND SOIL REPELLANT POLYMERS THEREOF

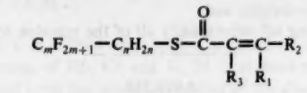
Eduard K. Kleiner, Dobbs Ferry, and Martin Knell, Ossining, both of N.Y., assignors to Geigy Chemical Corporation, Ardsley, N.Y.

Filed Apr. 10, 1968, Ser. No. 720,370

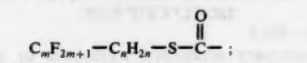
Int. Cl.[2] C07C *67/16, 69/60*

U.S. Cl. 260—455 R 2 Claims

1. A compound of the formula:

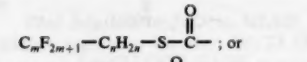


wherein
m is 6 to 12,
n is 1 or 2,
R_1 and R_2 are (a) hydrogen, (b) methyl, or

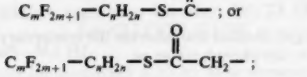


(c)

wherein *m* and *n* are as defined above; and R_3 is (a) hydrogen;



(c)



(d)

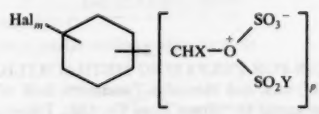
wherein *m* and *n* are as defined above;
provided that when
R_1 is (a), R_2 is (a), and R_3 is (c) or (d); or
R_1 is (a), R_2 is (c), and R_3 is (a) or (d); or
R_1 is (b), R_2 is (c), and R_3 is (a); or
R_1 is (c), R_2 is (a), and R_3 is (a) or (d); or
R_1 is (c), R_2 is (b), and R_3 is (a).

4,075,238
POLYHALOBENZYLIC DISULFOOXONIUM COMPOUNDS

Victor Mark, Evansville, Ind., and Leon R. Zengierski, North Tonawanda, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation of Ser. No. 410,723, Oct. 29, 1973, abandoned, and a continuation-in-part of Ser. No. 123,014, March 10, 1971, abandoned. This application Aug. 25, 1975, Ser. No. 607,326
Int. Cl.[2] C07C *141/14, 141/16, 47/48*
U.S. Cl. 260—458 C **23 Claims**

1. A compound of the formula:



wherein
Hal is a halogen selected from the group consisting of fluorine, chlorine, bromine and iodine;
X is a substituent selected from the group consisting of —H and

Y is a substituent selected from the group consisting of chlorine and hydroxy, provided when X is

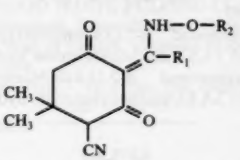
at least one Y is hydroxy;
m is at least one;
p is at least one;
m and *p* are integers so selected that their sum is six.

4,075,239
CYCLOHEXANE DERIVATIVES

Mikio Sawaki; Isao Iwataki, both of Odawara; Yoshihiko Hirono, Hiratsuka, and Hisao Ishikawa, Odawara, all of Japan, assignors to Nippon Soda Company, Limited, Tokyo, Japan

Continuation of Ser. No. 620,862, Oct. 9, 1975, Pat. No. 4,011,256, which is a division of Ser. No. 490,349, July 22, 1974, Pat. No. 3,950,420. This application Feb. 16, 1977, Ser. No. 769,346
Claims priority, application Japan, Aug. 15, 1973, 48-91425; Mar. 7, 1974, 49-25714
Int. Cl.[2] C07C *121/46*
U.S. Cl. 260—464 **4 Claims**

1. A compound of the formula



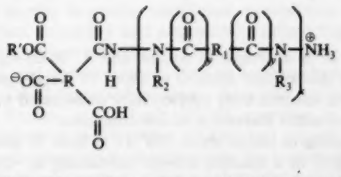
wherein
R_1 is selected from the group consisting of ethyl and propyl.
R_2 is selected from the group consisting of ethyl and allyl.

4,075,240
POLYSALTS OF POLYCARBOXYLIC ACID ESTERS AND HYDRAZINE OR HYDRAZIDES

Karl F. Schimmel, Verona, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc, Pittsburgh, Pa.

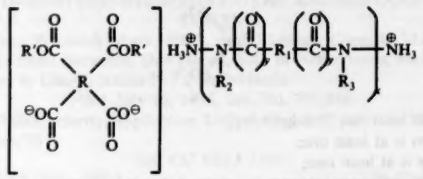
Division of Ser. No. 511,322, Oct. 2, 1974, Pat. No. 4,020,050, which is a division of Ser. No. 369,628, June 13, 1973, abandoned. This application Nov. 4, 1975, Ser. No. 628,612
Int. Cl.[2] C07C *69/76, 109/04, 109/08, 109/10*
U.S. Cl. 560/34 **6 Claims**

1. A polysalt consisting of a repeating moiety of the structural formula:



wherein R is a tetravalent organic radical having at least two carbon atoms, R' is a monovalent alkyl, cycloalkyl or alkenyl radical having 1 to 20 carbon atoms, R_1 is a divalent organic radical selected from the group consisting essentially of alkylene, arylene, and heterocyclic; R_2 and R_3 are monovalent alkyl, aryl, aralkyl, cycloalkyl or hydrogen radicals and *x* and *y* are either 1 or 0.

4. A polysalt consisting of a repeating moiety of the structural formula:



wherein R is a tetravalent organic radical having at least two carbon atoms, R′ is a monovalent alkyl, cycloalkyl or alkenyl radical having 1 to 20 carbon atoms, R_1 is a divalent organic radical selected from the group consisting essentially of alkylene, arylene, and heterocyclic, R_2 and R_3 are monovalent alkyl, aralkyl, cycloalkyl, or hydrogen radicals and x and y are either 1 or 0.

4,075,241

2-(ARYL)-3-(DIMETHYLAMINO)BUTYL-3,4,5-TRIMETHOXYBENZOATES

Elvio Bellasio, Albate (Como), and Franco Cristiani, Pavia, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed May 8, 1972, Ser. No. 251,025
Claims priority, application Italy, May 12, 1971, 24390/71
Int. Cl.[2] C07C *65/08*
U.S. Cl. 560—73 **2 Claims**

1. The compound β-2-(3,4-dimethoxyphenyl)-3-(dimethylamino)butyl 3,4,5-trimethoxybenzoate hydrochloride.

2. The compound α-2-(3,4-dichlorophenyl)-3-(dimethylamino)butyl 3,4,5-trimethoxybenzoate hydrochloride.

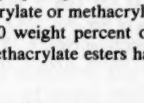
4,075,242

LOW MOLECULAR WEIGHT ACRYLATES OR METHACRYLATES

David Rhum, Westfield, N.J., and Patrick F. Aluotto, Cincinnati, Ohio, assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 380,314, July 18, 1973, abandoned, and Ser. No. 521,723, Nov. 7, 1974, abandoned. This application Mar. 12, 1976, Ser. No. 666,527
Int. Cl.[2] C07C *69/34*; C08F *20/12, 20/14*
U.S. Cl. 560—190 **12 Claims**

1. A process for preparing low molecular weight, room temperature liquid acrylate or methacrylate resins from monomers about 20 to 100 weight percent of which are selected from acrylate and methacrylate esters having the general formula:



wherein R′ is hydrogen or methyl and R″ is C_1–C_8 alkyl or mixtures thereof and about 0 to about 80 weight percent of which are selected from ethylenically unsaturated monomers copolymerizable therewith, which comprises:

A. heating to above about 150° C. at least 75 percent, by weight, of a reaction solvent containing an -OH group having a boiling point of above about 150° C. in a batch reactor;

B. adding at a temperature of above about 150° C. said monomers and the remaining solvent to the reactor over at least about 30 minutes so that the final polymerization solids of the reaction medium is above at least 30 weight percent;

C. maintaining the reaction above about 150° C. for a time sufficient to polymerize said monomers to a monomer to polymer conversion percentage of at least about 85 percent, by weight; and

D. stripping off substantially all of the reaction solvent.

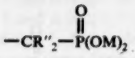
4,075,243

POLYQUATERNARY AMMONIUM METHYLENE PHOSPHONATES

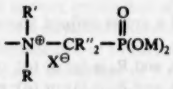
Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 237,883, March 24, 1972, Pat. No. 3,792,084. This application Oct. 29, 1973, Ser. No. 410,492
Int. Cl.[2] C07F *9/38*
U.S. Cl. 260—502.5 **7 Claims**

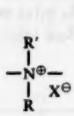
1. Polyquaternary ammonium methylene, or substituted methylene, phosphonates wherein all the methylene, or substituted methylene, phosphonate groups are of the formula



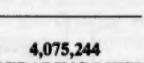
and are nitrogen-bonded and wherein the quaternary nitrogens are present in the phosphonates as



terminal groups and as



internal groups when there are more than 2 nitrogen atoms, there being at least two of the terminal groups in each phosphonate compound, wherein the nitrogen atoms are linked together by bridging groups containing at least 2 carbon atoms in each of the bridge chains, where the groups R and the bridging groups are hydrocarbon or hydrocarbon containing ethereal or hydroxy oxygen, where the groups R′ are R groups or



groups, where the groups R″ are hydrogen or hydrocarbon, where M is hydrogen or a salt moiety, and where X^{31} is an anion.

4,075,244

PROCESS FOR PREPARING METHACRYLIC ACID

Shinichi Akiyama, and Haruhisa Yamamoto, both of Takaoka, Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 523,684, Nov. 14, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,550
Claims priority, application Japan, Nov. 22, 1973, 48-131325; Mar. 14, 1974, 49-29405
Int. Cl.[2] C07C *51/32*
U.S. Cl. 260—530 N **17 Claims**

1. A process for the preparation of methacrylic acid which comprises reacting methacrolein with molecular oxygen in the vapor phase in the presence of an oxidation catalyst composition consisting essentially of a catalytic oxide of molybdenum (Mo), phosphorous (P), vanadium (V), at least one of rubidium (Rb), cesium (Cs), or potassium (K), and optionally at least one of strontium (Sr), zinc (Zn), cadmium (Cd), niobium (Nb), boron (B), lead (Pb) or tungsten (W), said catalyst composition having the following empirical formula:

$Mo_aP_bV_cL_dM_eO_f$

wherein L is at least one element selected from the group consisting of Rb, Cs and K; M is at least one element selected from the group consisting of Sr, Zn, Cd, Nb, B, Pb, and W; and *a, b, c, d, e,* and *f* each represent the number of atoms of each element; the atomic ratio of *a:b:c:d:e* is 12:0.1–8:0.1–8:0.1–8:0.6; and *f* is the number of oxygen atoms determined by the valence requirement of the other elements present.

4,075,245

PROCESS FOR PREPARING SOLUTIONS OF N-METHYLOL-CHLOROACETAMIDE

Wilfried Paulus, and Karl-Heinz Rullmann, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 1, 1976, Ser. No. 701,929
Claims priority, application Germany, July 23, 1975, 2532805
Int. Cl.[2] C07C *103/38*
U.S. Cl. 260—561 HL **2 Claims**

1. Process for preparing a 35 to 45% strength by weight solution of N-methylol-chloroacetamide, which comprises treating chloroacetic acid methyl ester in solution in isopropanol with ammonia at temperatures of −20° to 10° C and then reacting with paraformaldehyde at temperatures of 60° to 120° C after the addition of water and a basic catalyst.

4,075,246

1,3-BIS(2,2,2-FLUORODINITROETHOXY)-2,2-BIS(DIFLUORAMINO) PROPANE

Kurt Baum, Pasadena, and Vytautas Grakauskas, Arcadia, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 29, 1976, Ser. No. 737,116
Int. Cl.[2] C07C *93/04;* C06B *25/00*
U.S. Cl. 260—584 C **1 Claim**

1. 1,3-bis(2,2,2, -fluorodinitroethoxy)-2,2-bis(difluramino)-propane.

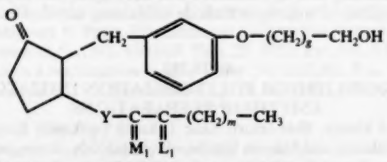
4,075,247

2-DECARBOXY-2-HYDROXYMETHYL-3,7-INTER-M-PHENYLENE-3-OXA-11-DEOXY-PGE$_1$ COMPOUNDS

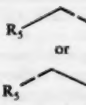
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,363, Jan. 8, 1976, Pat. No. 4,028,419. This application Mar. 17, 1977, Ser. No. 778,757
Int. Cl.[2] C07C *49/84*
U.S. Cl. 260—590 C **22 Claims**

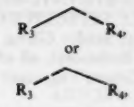
1. A prostaglandin analog of the formula



wherein Y is trans-CH=CH-; wherein M_1 is

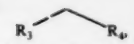


wherein R_5 is hydrogen or methyl; wherein L_1 is



or a mixture of

and



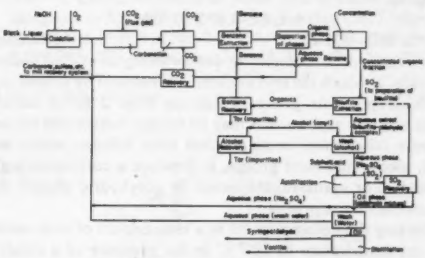
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl; wherein *g* is one, 2, or 3; and wherein *m* is one to 5, inclusive.

4,075,248

PRODUCTION OF SYRINGEALDEHYDE FROM HARDWOOD WASTE PULPING LIQUORS

Harry Borden Marshall, Senneville, and Donald L. Vincent, Pointe Claire, both of Canada, assignors to Domtar Limited, Montreal, Canada

Filed Sept. 7, 1976, Ser. No. 720,628
Int. Cl.[2] C07C *45/00*
U.S. Cl. 260—600 R **6 Claims**



1. The process for the production of syringealdehyde from a lignin-containing waste liquor of a hardwood kraft pulping operation comprising: forming a charge of said waste liquor and alkali, passing oxygen-containing gas in intimate contact with said charge in a reactor under elevated temperature and pressure thereby to oxidize said liquor, neutralizing said oxidized liquor, extracting said neutralized oxidized liquor with an organic solvent thereby to separate an organic fraction soluble in said organic solvent from an aqueous fraction containing residual lignin and inorganic chemicals, recycling said aqueous fraction to the kraft pulping operation to recover alkali values from said fraction, treating said organic fraction with an aqueous solution of sodium bisulfite to form from part of said organic fraction an aqueous solution of a sodium bisulfite complex of syringealdehyde and vanillin, separating said aqueous solution of said complex from the remainder of said organic fraction, washing said aqueous solution of said complex with an aliphatic alcohol having a chain of 4–6 carbons, acidifying said washed aqueous solution to break up said complex and form an oil consisting essentially of a mixture of syringealdehyde and vanillin, and separating syringealdehyde from vanillin by fractional distillation.

4,075,249

3,4,5-TRIMETHOXY-α-ETHYNYL-BENZHYDROL AS A FUNGICIDALLY EFFECTIVE COMPOUND

Edit Toth; Jozsef Törley; Sandor Görög; Laszlo Szporny; Eva Palosi, and Szabolcz Szeberenyi, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT., Budapest, Hungary

Division of Ser. No. 495,846, Aug. 8, 1974, Pat. No. 3,965,179. This application Nov. 10, 1975, Ser. No. 630,510

Claims priority, application Hungary, Aug. 15, 1973, RI 520

Int. Cl.[2] C07C *33/06*

U.S. Cl. 260—613 D 1 Claim

1. 3,4,5-trimethoxy-α-ethynyl-benzhydrol.

4,075,250

PRODUCTION OF PHENOLS

Peter Graham Spencer Field, St. Foy-les-Lyons, France, and Ronald Bennett, Chester, England, assignors to Burmah Oil Trading Limited, Cheshire, England

Filed May 5, 1975, Ser. No. 574,755

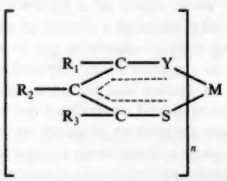
Claims priority, application United Kingdom, May 6, 1974, 19826/74

Int. Cl.[2] C07C *37/08*

U.S. Cl. 260—621 C 17 Claims

1. In the process comprising decomposing an aralkyl hydroperoxide, in which the aryl nucleus is substituted by at least one alkylhydroperoxide group containing from 2 to 24 carbon atoms and said aryl nucleus may be further substituted by one or more other substituents selected from halogen atoms and alkyl, alkoxy and nitro groups, to produce a correspondingly substituted or unsubstituted mono- or polyhydric phenol, the improvement comprising:

effecting the decomposition at a temperature of from ambient temperature to 180° C in the presence of a catalyst comprising a compound of the formula



wherein R_1, R_2 and R_3 are each independently selected from the group consisting of hydrogen atoms, straight chained and branched alkyl groups, phenyl, alkylphenyl groups and phenylalkyl groups, wherein the alkyl moieties contain from 1–8 carbon atoms, Y is an atom of oxygen or sulphur, M is a metal atom selected from the transition metals in Group VIII of the Periodic Table, and n is the oxidation state of the metal, said oxidation state being 2 or 3; and

recovering the produced phenol or substituted phenol from the decomposition product.

4,075,251

HYDROGENATION OF ORGANIC COMPOUNDS

Joseph K. Mertzweiller, and Horace M. Tenney, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 596,584, July 17, 1975, Pat. No. 3,978,149, which is a division of Ser. No. 499,793, Aug. 22, 1974, Pat. No. 3,932,547, which is a division of Ser. No. 253,765, May 16, 1972, Pat. No. 3,855,324, which is a continuation-in-part of Ser. No. 880,933, Nov. 28, 1969, Pat. No. 3,711,423, which is a continuation-in-part of Ser. No. 674,098, Oct. 10, 1967, abandoned. This application Aug. 30, 1976, Ser. No. 718,548

Int. Cl.[2] C07C *29/14*

U.S. Cl. 260—638 B 16 Claims

1. A process for the hydrogenation of a feed containing C_4–C_8 aldehydes comprising the steps of:

forming a catalyst by

impregnating a support containing at least about 0.1 millimoles of hydroxyl groups per gram of support, said support comprising alumina with an aqueous solution of a transition metal salt comprising nickel acetate;

heat-treating the impregnated support at a temperature of at least about 500° F.;

activating the heat-treated impregnated support by contacting same with an organometallic compound having the formula: QR_n, wherein Q is selected from Group I, II or III metals of the Periodic Chart of the Elements, R is selected from the group consisting of hydride and alkyl, aryl, alkaryl, aralkyl and cycloalkyl radicals containing from 1 to about 20 carbon atoms and wherein n ranges from 1 to 3 and satisfies the valence of Q;

treating the activated supported metal complex in the presence of hydrogen at a temperature of at least about 300° F; and thereafter contacting said catalyst with said feed in the presence of a hydrogen-containing gas, thereby producing a hydrogenation reaction.

4,075,252

DIAZOTIZATION-FLUORINATION IN A MEDIUM OF HYDROGEN FLUORIDE-CONTAINING AMMONIUM IONS

Max M. Boudakian, Pittsford, N.Y., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 627,874, Oct. 31, 1975, abandoned. This application July 23, 1976, Ser. No. 707,975

Int. Cl.[2] C07C *25/13*

U.S. Cl. 260—649 F 11 Claims

1. In a process for preparing a fluorobenzene by (1) diazotizing a corresponding aminobenzene substrate in the presence of hydrogen fluoride and a diazotization agent selected from the group consisting of sodium nitrite, potassium nitrite, nitrous anhydride, nitrous acid, a nitrosyl halide, and a complex of a nitrosyl halide with hydrogen fluoride, to produce a corresponding diazonium fluoride and (2) decomposing said diazonium fluoride, the improvement which comprises:

conducting said diazotization and decomposition steps in a solution of hydrogen fluoride containing ammonium ions.

4,075,253

ORGANOLITHIUM POLYMERIZATION INITIATORS AND THEIR PREPARATIONS

Shigeki Horiie; Shin-Ichiro Asai; Takashi Torikoshi; Kazuhiro Shirakawa, and Minoru Handa, all of Machida, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1975, Ser. No. 577,980

Claims priority, application Japan, May 15, 1974, 49-54125

Int. Cl.[2] C07F *1/02*

U.S. Cl. 260—665 R 11 Claims

1. A process for preparing a polymerization initiator which comprises preparing a dilithium initiator solution by reacting lithium metal with alpha-methylstyrene in a polar solvent at a temperature of about −20° C to +30° C in a ratio of about 0.25

to 2.0 gram atoms of lithium metal per mole of said alpha-methylstyrene wherein the rate of addition of the alpha-methylstyrene ranges from about 0.06 mole to 2.0 moles per gram atom of lithium metal per hour, thereafter adding gradually at least 0.2 mole of a conjugated diene over a period more than about one hour at a temperature of about −20° C to +30° C to said dilithium initiator solution so as to consume completely any unreacted alpha-methylstyrene monomer and simultaneously obtain alpha-methylstyrene-conjugated diene oligomer dilithium, and then additionally adding at least two moles of said conjugated diene at a temperature of about −20° C to +30° C to said alpha-methylstyrene-conjugated diene oligomer dilithium so as to prepare a stable and non-polar solvent soluble alpha-methylstyrene-conjugated diene oligomer dilithium.

4,075,254

HYDROGENATION OF ALKYLSTYRENE TO PRODUCE ALKYLBENZENE USING COPPER CHROMITE CATALYSTS

Norman S. Boodman, and Jack W. Walter, both of Penn Hills Township, Allegheny County, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 629,956, Nov. 7, 1975, abandoned. This application Apr. 29, 1977, Ser. No. 792,374

Int. Cl.[2] B01J *23/86;* C07C *15/02*

U.S. Cl. 260—667 **14 Claims**

1. In the process for producing alkylbenzene by hydrogenating a feed stream comprising α-alkylstyrene, the improvement comprising carrying out the hydrogenation in the presence of a copper chromite catalyst.

4,075,255

STEAM DEALKYLATION WITH HYDROGEN TREATED CATALYST OF GROUPS I, VI B, VIII

Tansukhlal G. Dorawala, Wappingers Falls; Russell R. Reinhard, Hopewell Junction, and John H. Estes, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 610,198, Sept. 4, 1975, Pat. No. 4,008,181. This application Aug. 26, 1976, Ser. No. 717,843

Int. Cl.[2] C07C *3/58*

U.S. Cl. 260—672 R **8 Claims**

1. The process for dealkylating an alkylaromatic hydrocarbon which comprises

a. treating a calcined supported catalyst bearing oxides of (i) a Group VIII metal, (ii) A group VI B metal, and (iii) a Group I A metal in the presence of hydrogen for 4–16 hours at 950°–1400° F thereby forming a treated catalyst;

b. passing a mixture of steam and alkylaromatic hydrocarbon, at steam dealkylating conditions, into contact with said treated catalyst thereby forming a product gas containing dealkylated alkylaromatic hydrocarbons; and

c. recovering said dealkylated alkylaromatic hydrocarbon.

4,075,256

PURIFICATION OF UNSATURATED COMPOUNDS

Alan W. Foster, and Alfio J. Besozzi, both of Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 420,043, Nov. 29, 1973, Pat. No. 3,998,902, which is a continuation-in-part of Ser. No. 223,363, Feb. 3, 1972, abandoned. This application Aug. 16, 1976, Ser. No. 714,744

Int. Cl.[2] C07C *11/12*

U.S. Cl. 260—680 E **2 Claims**

2. In a vapor phase process for the preparation of unsaturated hydrocarbons comprising

catalytic oxidative dehydrogenation of a feed stream of hydrocarbon compounds having 4 to 8 carbon atoms to produce an unsaturated hydrocarbon product stream having a greater degree of ethylenic unsaturation than said feed stream and containing organic carbonyl compounds as an impurity

wherein the improvement comprises contacting only said product stream in vapor phase at a temperature in the range of 250° to 800° C and containing less than 5 mol percent free oxygen with a solid catalyst for destroying said carbonyl compounds and consisting essentially of Ca_2SiO_4 and calcium aluminate.

4,075,257

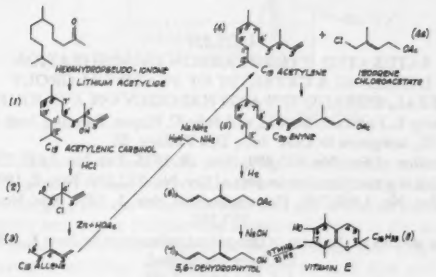
3,7,11-TRIMETHYLDODECA-1,2-DIENE

Ralph E. Close, Jacksonville, Fla., and William Oroshnik, Plainfield, N.J., assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 622,972, Oct. 16, 1975, which is a division of Ser. No. 560,550, March 20, 1975. This application Feb. 25, 1977, Ser. No. 772,264

Int. Cl.[2] C07C *11/12*

U.S. Cl. 260—680 R **1 Claim**



1. The compound 3, 7, 11-trimethyldodeca-1,2-diene.

4,075,258

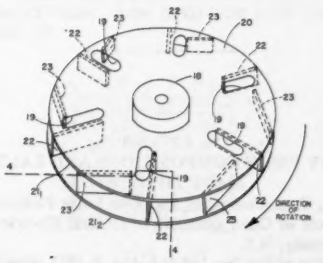
ISOPARAFFIN OLEFIN ALKYLATION UTILIZING HIGH INTENSITY MIXING

Robert H. Caulk, and David E. Allan, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 625,072, Oct. 23, 1975, Pat. No. 3,999,889. This application July 23, 1976, Ser. No. 708,058

Int. Cl.[2] C07C *3/54*

U.S. Cl. 260—683.44 **11 Claims**



1. In an alkylation process wherein a hydrocarbon phase, inclusive of an isoparaffin and olefin, is contacted with an acid catalyst in aqueous phase to produce an acid soluble oil and alkylation products, and wherein said hydrocarbon and aqueous phases are agitated, mixed and dispersed as an emulsion of said phases by use of a mixing apparatus, the head of said apparatus being inserted within the hydrocarbon and aqueous phases and rotated, the improvement comprising agitating said phases with said mixing apparatus, said head comprising a pair of coaxially aligned upper and and lower discs of similar size, geometric configuration and shape, a plurality of radially extended slots through said upper disc, the length of each slot being relatively long as contrasted with its width, compartments being formed between the spaced discs by a plurality of blade pairs associated with each of said radial slots, one blade of a pair being extended substantially from the peripheral edge

of said discs along the radius thereof for a distance of from 178 to about one-fourth of the radius, while the other blade of the pair being extended from the opposite side of a slot in a direction perpendicular to said radius and extended from the peripheral edge of the disc to the edge of said slot while maintaining the acid strength of the aqueous phase at concentration ranging from about 98 to 94 percent, and an acid soluble oil concentration ranging from about 0.5 to about 3 percent, based on the weight of the aqueous phase.

4,075,259

SATURATED HYDROCARBON ISOMERIZATION UTILIZING A CATALYST OF PLATINUM GROUP METAL, COBALT, TIN AND HALOGEN ON A CARRIER

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 633,889, Nov. 20, 1975, Pat. No. 4,013,738, which is a continuation-in-part of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,960,710. This application Nov. 1, 1976, Ser. No. 737,352

The portion of the term of this patent subsequent to June 1, 1993, has been disclaimed.

Int. Cl.[2] C07C *5/28*

U.S. Cl. 260—683.68 **16 Claims**

1. A process for isomerizing a saturated hydrocarbon which comprises contacting said hydrocarbon at isomerization conditions with a catalyst comprising a porous carrier material containing, on an elemental basis, 0.01 to 2 wt. % platinum group metal, 0.1 to 5 wt. % cobalt, 0.01 to 5 wt. % tin and 0.1 to 10 wt. % halogen, wherein substantially all of the platinum group metal, cobalt and tin are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal and cobalt are present in the elemental metallic state and wherein substantially all of the tin is present in an oxidation state above that of the elemental metal.

4,075,260

EPOXY RESIN COMPOSITIONS AND LAMINATE MADE THEREWITH

Lo Kwang Tsen, Coshocton, and John Louis Palkiewicz, Nashport, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 169,463, Aug. 8, 1971, abandoned. This application Feb. 13, 1976, Ser. No. 657,777

Int. Cl.[2] C08L *63/00*

U.S. Cl. 260—830 TW **7 Claims**

1. An epoxy resin composition which comprises a blend of first and second epoxy resins, said first epoxy resin comprising the diglycidyl ether of bisphenol A having an epoxy equivalent weight of 170 to 200 and an average functionality of not more than 2, said second epoxy resin comprising the reaction product of diglycidyl ether - bisphenol A epoxy resin and a polyhydric phenol selected from the group consisting of bisphenol A and tetrabromobisphenol A, said resulting second epoxy resins having an epoxy equivalent weight of 900 to 1900 and an average functionality of not more than 2, the proportions of said first resin ranging from about 30 to 60% by weight of resin solids and of said second resin from about 70 to 40% by weight of resin solids, and a curing system.

4,075,261

POWDER COATING COMPOSITION

Kanji Fujiyoshi; Yutaka Mizumura, and Junji Sono, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 373,218, June 25, 1973, Pat. No. 3,953,403. This application May 22, 1975, Ser. No. 580,376

Claims priority, application Japan, June 28, 1972, 47-65317; June 29, 1972, 47-65687; United Kingdom, June 27, 1973, 30522/73; Germany, June 27, 1973, 2332749; France, June 28, 1973, 73 23796; Italy, June 27, 1973, 68921/73

Int. Cl.[2] C08L *61/20, 61/28, 67/06*

U.S. Cl. 260—850 **7 Claims**

1. A powder coating composition comprising
1. a terephthalic acid-based unsaturated polyester which is prepared by reacting
   a. terephthalic acid or its lower alkyl ester, and
   b. an α-olefinic dicarboxylic acid or its anhydride, and
   c. optionally, an organic acid having at least three carboxy groups in the molecule or its anhydride, and
   d. an aliphatic or alicyclic glycol; and
2. an organic peroxide and an alkoxylatedpolyamino aldehyde resin.

4,075,262

COPOLYESTERS CAPABLE OF FORMING AN ANISOTROPIC MELT

John Raymond Schaefgen, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

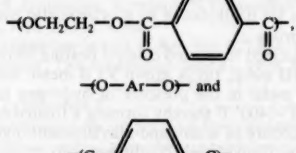
Continuation-in-part of Ser. No. 604,073, Aug. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 468,696, May 10, 1974, abandoned. This application Dec. 21, 1976, Ser. No. 752,996

Int. Cl.[2] C08L *67/02*

U.S. Cl. 260—860 **10 Claims**

1. A fiber-forming melt spinnable copolyester capable of forming an anisotropic melt and consisting essentially of units of the formula:

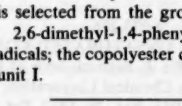
I



II

and

III



wherein units II and III are present in substantially equimolar amounts; Ar is selected from the group of chloro-, methyl-, 2,6-dichloro-, 2,6-dimethyl-1,4-phenylene, or chloro-4,4'-biphenylene radicals; the copolyester containing from 15–70% by weight of unit I.

4,075,263

PROCESS FOR PREVENTING HYDROLYTIC DEGRADATION OF LINEAR SATURATED AROMATIC POLYESTERS COMPRISING A THERMOPLASTIC SATURATED AROMATIC POLYESTER AND A MOISTURE SCAVENGER POLYMER

Constance A. Lane, Philadelphia, and Joseph C. Koziar, Cornwells Heights, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

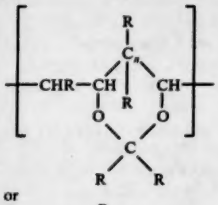
Filed Apr. 13, 1976, Ser. No. 676,596

Int. Cl.[2] C08L *67/06*

U.S. Cl. 260—873 **13 Claims**

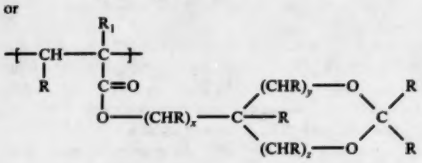
1. Composition comprising a linear thermoplastic saturated aromatic polyester, and a minor amount of a moisture scaven-

ger polymer containing cyclic acetal or cyclic ketal units, said units having a structure defined by either



I.

or



II.

where

R_1 is hydrogen or methyl;

each R is independently selected from hydrogen or an alkyl group having one to five carbon atoms;

x is an integer from one to nine;

y and z are zero or an integer from one to three but the sum of y plus z must equal one, two or three; and

n is 0, 1, or 2.

4,075,264

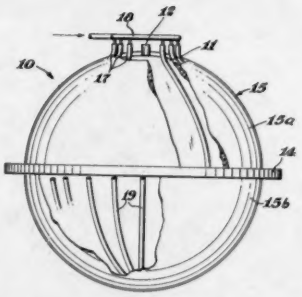
METHOD OF INSULATING A CONTAINER

Robert A. Hay, II, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 2, 1976, Ser. No. 673,335

Int. Cl.² B21D *51/18*; B29D *27/04*

U.S. Cl. 264—46.5 **6 Claims**



1. A method for the insulating of a container, the method comprising providing a container having at least a generally rigid containment wall, disposing over at least one face of the containment wall a layer of solid thermally insulating material of substantially lesser rigidity than the container wall to provide thermal insulation for the container, the improvement which comprises displacing the thermally insulating layer away from the container wall by means of fluid pressure applied between the container wall and the insulating layer and providing a solid thermal insulating material to a space formed between the container wall and the insulating layer.

4. The method of claim 1 wherein said fluid pressure is applied by a foamable, hardenable resinous composition.

4,075,265

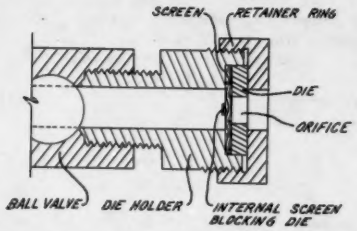
PROCESS FOR MAKING INSTANT SHAPED FOAMS

Charles E. McClung, Kettering; James L. Schwendeman, and Ival O. Salyer, both of Dayton, all of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 597,113, July 18, 1975, abandoned. This application Apr. 30, 1976, Ser. No. 681,884

Int. Cl.² B29D *27/00*

U.S. Cl. 264—53 **14 Claims**



1. In a process for rapidly producing a substantially uniform, elongated, cellular, thermoplastic article comprising rapidly discharging from a vessel a pressurized gel of a solid thermoplastic amorphous polymer and a gaseous solvent in the range of about 25–100% by weight of said polymer, said polymer having a solubility parameter between 8.4 and 10.4 and an intrinsic viscosity value between 0.5 and 5.0, and said solvent being capable of forming a flowable gel with the polymer when subjected to super-atmospheric pressure, the improvement for shaping the article comprising restraining sufficiently the speed of flow of the gel from the vessel through the die to allow the die to shape the article, said gel being present in said vessel at a temperature in the range of about −10° to 50° C.

4,075,266

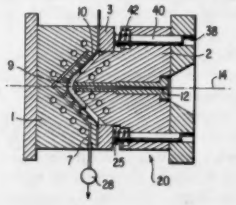
METHOD FOR COATING FOIL MATERIAL

Friedrich Theysohn, An den Hilligenwohren 9, D-3000 Hannover, Germany

Filed Nov. 1, 1976, Ser. No. 737,571

Int. Cl.² B29C *17/04*; B29D *9/00*; B29F *1/00*

U.S. Cl. 264—92 **4 Claims**



1. In an injection molding method for coating foil material of any desired shape with an injectable and pressable mass which stabilizes the foil material, the steps comprising:

a. pressing an initially planar heated foil material by means of a depressor against a movable mold member of an injection mold having a movable mold member and a stationary mold member, the injection mold having a shape which corresponds to the later shape of the foil material;

b. then pulling the foil material against the surface of the movable mold member by subatmospheric pressure;

c. subsequently moving the movable mold member toward the stationary mold member of the injection mold to provide a gap between the foil material and stationary mold member and slowly injecting the mass into the gap

remaining between the foil material and the stationary mold member; and

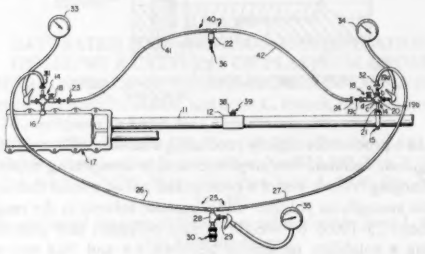
d. thereafter further moving the two mold members closer together to finally distribute the mass over the foil material and press the mass to the required thickness.

4,075,267

METHOD AND APPARATUS FOR MAKING PRESSURE PLUGS IN CABLES OR CABLE STUBS WITH CONTINUOUS AIR FLOW

James W. Florer, Los Angeles, Calif., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 9, 1976, Ser. No. 694,486
Int. Cl.[2] H01B *13/00*
U.S. Cl. 264—94 **11 Claims**



1. An apparatus for maintaining a continuous air flow through a cable under continuous air pressure during formtion of a cable pressure plug in said cable, said apparatus comprising:

a supplemental air source;

air pressure input assembly means connected to said supplemental air source for routing the air therefrom;

pressure valve crossover assembly means connected to said cable on each side of and spaced from the proposed location of said cable pressure plug and connected to said air pressure input assembly means for regulating and directing the flow of air coming from said air pressure input assembly means;

adjustable air pressure equalization assembly means connected between said pressure valve crossover assembly means on both sides of said proposed cable plug location for maintaining an adjusted equalized pressure therebetween; and

at least one gauge means adapted to be connected to said pressure valve crossover assembly means and said air pressure equalization assembly means for determining the air pressure thereat.

8. A method for forming a cable pressure plug in a cable under continuous air pressure while maintaining continuous air flow through said cable, said method comprising:

determining the air pressure in said cable on both sides of the proposed pressure plug location;

installing two pressure valve crossover assembly must spaced from each other, one on each side of the proposed pressure plug location;

connecting an air pressure input assembly means between both of said air valve crossover assembly means;

connecting an air pressure equalization assembly means between both of said pressure valve crossover assembly means, said air pressure equalization assembly means having an adjustable pressure release valve;

connecting gauging means to each of said pressure valve crossover assembly means and to said air pressure equalization assembly means;

opening said pressure release valve in said air pressure equalization assembly completely;

adjusting a supplemental air source to a desired output pressure and attaching said supplemental air source to said air pressure input assembly means;

adjusting said pressure release valve of said air pressure assembly means to continuously maintain a constant air pressure through said air pressure assembly means;

adjusting said pressure valve crossover assembly means to achieve equal pressure readings on said gauging means attached thereto by regulating downward the crossover assembly means on the higher pressure side;

preparing said cable and installing a pressure plug injecting means at the proposed pressure plug location;

injecting a predetermined amount of pressure plug forming compound into said cable through said pressure plug injecting means;

continuously maintaining a constant pressure on both sides of said pressure plug location by adjusting the crossover valve assembly means on the higher pressure side while said compound is being injected into said cable;

closing the pressure plug injecting means after all of the plugging compound has been completely injected into said cable;

maintaining equalized pressure on both sides of said plug location until said plugging compound is set; and

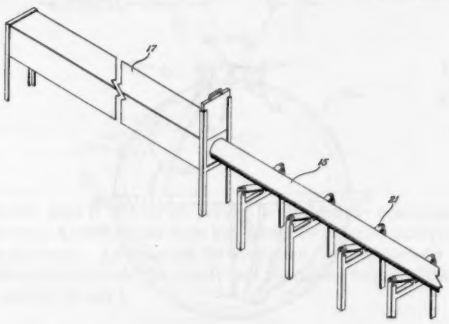
discontinuing the supplemental air supply once said plugging compound is set, and removing said air pressure input assembly means, said air pressure equalization assembly means and said pressure valve crossover assembly means from said cable.

4,075,268

METHOD OF MAKING DUAL WALL PIPE WITH FOAM INSULATION BETWEEN PIPE WALLS

Harold L. Nolan, 1914 Elmhurst Drive, Arlington, Tex. 76012

Filed Sept. 20, 1976, Ser. No. 724,637
Int. Cl.[2] B29C *17/00, 27/02;* B29D *23/00;* B29F *5/00*
U.S. Cl. 264—138 **14 Claims**



1. A method of insulating a conduit comprising:

heating a thermoplastic pipe to cause expansion of its diameter; the thermoplastic pipe being larger in diameter than the conduit, forming an annular space between the thermoplastic pipe and the conduit when the conduit is carried concentrically within the thermoplastic pipe;

forming an annular layer of insulating material of a size substantially equal to the annular space when the thermoplastic pipe is at ambient temperature;

inserting the conduit into the annular layer; and

inserting the annular layer into the thermoplastic pipe while the thermoplastic pipe is at an elevated temperature, to facilitate insertion.

4,075,269

PROCESS FOR PRODUCING WHOLLY AROMATIC POLYAMIDE FIBERS OF HIGH STRENGTH

Rufus S. Jones, Jr., Randolph; Marshall Tan, Ridgefield Park, and Eui Won Choe, Randolph, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Sept. 23, 1976, Ser. No. 726,089
Int. Cl.[2] D01D 5/12
U.S. Cl. 264—184 32 Claims

1. An improved process for preparing wholly aromatic polyamide fibers comprising:

a. providing a spinning solution containing from about 10 to 30 percent by weight of a wholly aromatic polyamide having (1) chain extending bonds from the aromatic nuclei thereof which are coaxial or parallel and oppositely directed, and (2) a sulfur content of at least 0.5 percent by weight as sulfonic acid and/or sulfonate groups attached to said aromatic nuclei of said wholly aromatic polyamide;

b. solution spinning said spinning solution of said wholly aromatic polyamide through a spinning jet to provide as-spun fibers having an inherent viscosity of at least 1.0; and

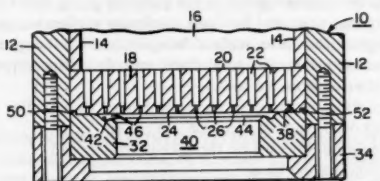
c. thermally treating said as-spun fibers at a temperature within the range of about 150° to 650° C. while under a longitudinal tension sufficient to maintain a constant length or to elongate the fibers up to about 5 percent of the as-spun length thereby producing fibers having a single filament tenacity of at least 15 grams per denier, an elongation of at least 1.5 percent, and an initial modulus of at least 400 grams per denier.

4,075,270

EXTRUSION DIE MASK

George M. Cunningham, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 532,362, Dec. 13, 1974, Pat. No. 3,947,214.
This application Nov. 10, 1975, Ser. No. 630,345
Int. Cl.[2] B29D 23/04
U.S. Cl. 264—209 2 Claims



1. A method of forming an integral skin about an extruded honeycomb article as the article is being extruded, comprising the steps of extruding batch material through a die to form a honeycomb article, simultaneously collecting batch material extruded through said die in a reservoir peripherally of said extruded article, flowing such collected material radially inwardly through a predetermined gap toward the outer periphery of said extruded article, and forming an integral skin of predetermined thickness proportional to said predetermined gap on the outer periphery of said extruded article with the material flowing radially thereto.

4,075,271

PRODUCTION OF POLYCAPROAMIDE FIBER WHEREIN POLYCAPROAMIDE IS REACTED WITH PHENYLENE BIS-(3-BUTANE-1,2-DICARBOXYLIC ANHYDRIDE)

Robert Alden Lofquist, Richmond, and John Christopher Haylock, Midlothian, both of Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 622,273, Sept. 10, 1975. This application Oct. 27, 1976, Ser. No. 735,932
The portion of the term of this patent subsequent to Dec. 6, 1994, has been disclaimed.
Int. Cl.[2] C08G 69/46; D02J 1/22
U.S. Cl. 264—210 F 2 Claims

1. In a process for the formation of polycaproamide fiber from a fiber-forming polycaproamide polymer having excess number of carboxyl end groups over amino end groups, by melt-extruding the polymer through an orifice into a quenching medium and thereafter stretching the resulting filament, the improvement wherein said fiber-forming polycaproamide polymer is prepared by a process comprising:

a. forming a molten polymerization mixture at 240°–290° C. from e-caprolactam;

b. smoothly stirring said polymerization mixture while flowing over the surface thereof an inert gas at a flow rate of at least 1 unit volume of said gas, measured at standard temperature and pressure, per hour per each unit volume of said polymerization mixture, until the total primary amino group plus carboxyl group analysis of the resulting hot water washed and dried polymer is between 95 and 135 milliequivalents per kilogram of polymer; and

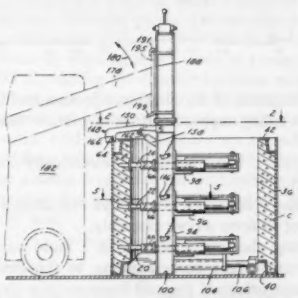
c. reacting said polymer at 250°–290° C. with about 0.06–0.7 mol per 100 mols of lactam in the polymer, of phenylene-bis-(3-butane-1,2,-dicarboxylic anhydride) until the primary amino group analysis of the polymer is between 5 and 35 milliequivalents per kilogram of polymer and the carboxyl group analysis of the polymer is between 30 and 90 milliequivalents per kilogram of polymer, thereby reducing the occurrence of nubs in the fiber.

4,075,272

LADDER RUNG IMPLANTER

Edward P. Washabaugh, 401 Kelton St., Bay City, Mich.

Division of Ser. No. 523,438, Nov. 13, 1974, Pat. No. 3,989,177.
This application Apr. 16, 1976, Ser. No. 677,726
Int. Cl.[2] B28B 1/00, 23/00
U.S. Cl. 264—249 6 Claims



1. The method of casting concrete manhole sections and implanting steps therein comprising positioning a base ring and an outer form on a turntable, rotating the turntable to bring the base ring and outer form to a casting station, extending an inner form upwardly through the base ring in concentric relation with the outer form, pouring concrete between the forms and casting the section therebetween, withdrawing the inner form from the green concrete section, rotating the turntable to

another position, extending upwardly through the base ring and the green section step implanting means including a laterally shiftable step carrier, locating the implanting means against the base ring and upper edge of the outer form, shifting the carrier to implant a step carried thereby into the green concrete section, withdrawing the implanting means downwardly out of the green section, and removing the ring and outer form and the green manhole section from the turntable to a place for curing.

5. The method of affixing a manhole step having at least one projecting arm for embedment in a green concrete wall of a manhole comprising: positioning the step to be affixed so that the free end of the arm is disposed in confronting relation with the green concrete manhole wall and such that the plane of the step is substantially perpendicular to the axis of the manhole, applying a continuous and uninterrupted force exerted by a power source to the step in the direction to urge the arm into the green concrete wall and of a magnitude sufficient to overcome the resistance of penetration of the arm thereinto with the result that the arm is advanced into the wall in a continuous and uninterrupted manner, continuing the application of such uninterrupted force until the arm of the step has penetrated the green concrete wall to a depth represented by the abuttment of a depth ring carried by the arm with the inner surface of such wall, and further continuing the application of such force to the step to forcibly embed the depth ring in such surface of the wall thus compacting the green concrete immediately surrounding the penetrated portion of the arm.

4,075,273

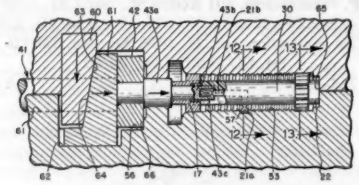
METHOD OF MAKING A COIL FORM BY INJECTION MOLDING

James P. Liautaud, River Bluff Road, Trout Valley, Cary, Ill. 60013

Division of Ser. No. 676,682, April 14, 1976, abandoned. This application Oct. 28, 1976, Ser. No. 736,323

Int. Cl.[2] B29D *3/00*; B29F *1/10*

U.S. Cl. 264—250 **17 Claims**



1. The method of forming an injection-molded coil form having a winding support surface of precise dimensions comprising:

forming a coil insert member of electrically non-conductive material;

positioning electrically conductive end fittings at either end thereof to form a core assembly;

positioning the core assembly in a mold cavity having a molding surface corresponding to the desired winding support surface of the coil form;

injecting plastic into the mold cavity to form a thin overmold layer on said core to provide the desired winding support surface, and ejecting the coil form from the mold cavity;

said forming a core including forming said core to dimensions which provide a core assembly of greater length than the coil form and axially comprising said core assembly before said injecting step to obtain a desired predetermined length for said core assembly.

4,075,274

METHOD FOR DRAWING AND HEAT-TREATING POLYESTER YARNS

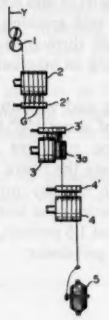
Isao Kobayashi; Yoshiharu Asada, both of Matsuyama, and Shiro Kumakawa, Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 457,143, April 1, 1974, abandoned. This application Mar. 18, 1976, Ser. No. 668,037

Claims priority, application Japan, Apr. 7, 1973, 48-39123

Int. Cl.[2] B29C *17/02*

U.S. Cl. 264—290 T **10 Claims**



1. A method for drawing and heat treating a polyester yarn which comprises the successive steps of:

A. feeding an undrawn multifilament linear polyester yarn having a second order transition point Tg over a heated feed roller having a substantially uniform surface temperature of from (Tg − 10° C) to (Tg + 30° C);

B. picking up the yarn from the preceding heated roller onto a heated draw roller having a surface temperature which increases continuously from the yarn in-coming roller surface contact point to the yarn out-going roller surface contact point and having a maximum surface temperature higher than the surface temperature of the preceding heated roller, at a total draw ratio from the heated feed roller of from 3.5 to 7.5;

C. picking up the yarn from the heated draw roller in step (B) onto a non-heated take-up roller;

D. cooling the yarn on the take-up roller; and

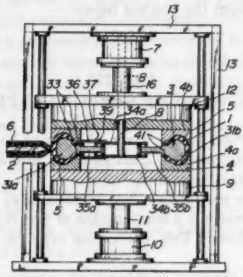
E. winding the yarn;

with the provisos that: (i) the yarn is shrunk from 1 to 10% on the heated draw roller in step (B), (ii) the yarn is shrunk a further 1 to 10% between the heated draw roller in step (B) and the take-up roller in step (C), and (iii) the yarn is picked up on the heated draw roller in step (B) at a low surface temperature point and discharged at a higher surface temperature point wherein when the operation of the method is resumed after stopping, the running speed of the yarn on the take-up roller is maintained at not more than (100 − 5.7 × S) m/min., wherein S is the total shrinkage of the yarn, until the yarn heated during stoppage has been shrunk in the subsequent shrinking step, and then the yarn is passed over the take-up roller at a running speed of 200 to 1200 m/min.

4,075,275
METHODS OF CASTING PNEUMATIC TIRES

Kazuhiro Nishimura, Kodaira; Jumei Harada, Higashi-Murayama; Tetsuhiko Migita, Kodaira, and Tsutomu Matsunaga, Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Division of Ser. No. 568,350, April 15, 1975, Pat. No. 3,994,650. This application Aug. 4, 1976, Ser. No. 711,668
Claims priority, application Japan, Apr. 22, 1974, 49-45212
Int. Cl.[2] B29C *1/12*
U.S. Cl. 264—313 **3 Claims**



1. In a method of casting pneumatic tires by pouring a fluidized tire-forming material into a molding cavity defined between the outer peripheral surface of a separable hard core of a mold assembly and the inner peripheral surface of an outer separable hard mold member of said mold assembly, said outer peripheral surface of said separable core defining the inner peripheral surface of a pneumatic tire to be cast and said inner peripheral surface of said outer separable mold member defining the outer peripheral surface of the pneumatic tire to be cast, the improvement comprising the steps of: coaxially aligning said separable core within said outer separable mold member to define said molding cavity therebetween, said core having at least three segments circumferentially arranged and adjoining with each other through a junction surface to make said core toroidal in shape, said junction surface permitting alternate segments to be retracted in a radial direction in succession, and each of said segments being provided at its inner peripheral upper and lower edges with portions engageable with said separable mold members, pouring a fluidized tire-forming material into said molding cavity under pressure, soldifying the material thus poured, separating said outer separable mold member from said tire and said core, retracting alternate segments of said separable core in the radial direction and then moving said alternate segments into planes defined by said segments which are different than a plane defined by the remaining unretracted segments, retracting the remaining unretracted segments of said separable core in the radial direction, and removing the cast tire from said mold assembly.

4,075,276
BORON NITRIDE-BORON NITRIDE COMPOSITES

James Economy, Eggertsville, N.Y.; Choll K. Jun, Greensburg, Pa., and Ruey Y. Lin, Williamsville, N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Feb. 27, 1974, Ser. No. 446,452
Int. Cl.[2] C04B *35/58*
U.S. Cl. 264—332 **9 Claims**

1. A process for the preparation of boron nitride-boron nitride composite bodies, comprising the steps of:

a. forming a blend of from about 10 to about 90 percent of essentially pure polycrystalline boron nitride fibers with from about 90 to about 10 percent of partially nitrided boric oxide fibers, said boron nitride fibers and said partially nitrided boric oxide fibers having a maximum diameter of 10 microns, and said partially nitrided fibers consisting essentially of boron, oxygen, hydrogen, and from about 30 percent to about 55 percent by weight of nitrogen;

b. forming a composite body of said blended fibers;

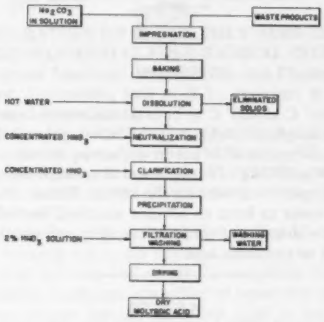
c. heating said composite body, at a pressure of from about 200 to about 500 psi in an inert atmosphere, to a first elevated temperature at which essentially all boric oxide present is decomposed; and

d. further heating said body to a second elevated temperature of from about 2000° C to about 2200° C.

4,075,277
PROCESS FOR RECOVERING MOLYBDENUM VALUES FROM SPENT CATALYSTS

Herman Castagna, Moutiers; Guy Gravey, Saint Marcel, and Andre Roth, Moutiers, all of France, assignors to Metaux Speciaux S.A., Paris, France

Filed Jan. 31, 1977, Ser. No. 763,911
Claims priority, application France, Feb. 5, 1976, 76 03674
Int. Cl.[2] C01G *39/00*
U.S. Cl. 423—55 **7 Claims**



1. A process for recovering molybdenum in the form of molybdic acid from alumina containing spent catalysts containing molybdenum oxide or molybdenum sulfide comprising treating the alumina containing spent catalyst with an aqueous solution of sodium carbonate at a temperature of from 60° to 100° C, and in a quantity in excess of that stoichiometrically necessary for obtaining the molybdenum in the form of sodium molybdate and the sulfur in the form of sodium sulfate which excess expressed in weight of sodium carbonate does not exceed 10%, baking the sodium carbonate treated alumina containing spent catalysts at a temperature of from 600° to 800° C to convert the molybdenum present to sodium molybdate, cooling to a temperature of from 70° to 80° C, dissolving the sodium molybdate by washing in hot water at a temperature of from 60° to 100° C, cooling the dissolved sodium molybdate to a temperature not exceeding 30° C, neutralizing the cooled solution of sodium molybdate by continuously introducing concentrated nitric acid at a temperature not exceeding 30° C and at a rate of flow adjusted to achieve a pH value of 5 to 6 to convert the sodium molybdate to molybdic acid, further adding nitric acid to clarify the nitric acid solution, and precipitating molybdic acid.

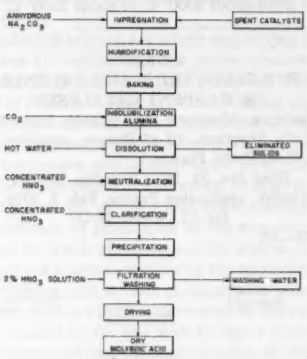
4,075,278
PROCESS FOR RECOVERING MOLYBDENUM VALUES FROM SPENT CATALYSTS

Guy Gravey, Saint Marcel; Paul Grolla, and Andre Roth, both of Moutiers, all of France, assignors to Metaux Speciaux S.A., Paris, France

Filed Feb. 3, 1977, Ser. No. 765,383
Claims priority, application France, Nov. 22, 1977, 77 35867
Int. Cl.[2] C01G *39/00*
U.S. Cl. 423—55 **7 Claims**

1. A process for recovering molybdenum in the form of a

substantially aluminum-free compound from spent catalyst based on active alumina comprising mixing the spent catalyst with sodium carbonate in the form of an anhydrous powder, whereby the sodium carbonate is distributed over the surface of the catalyst particles, adding water at ambient temperature and restirring to obtain by virtually complete absorption of the water inside the catalyst particles to impregnate the spent catalyst, baking the catalyst thus impregnated at a temperature



of from 600° C to 800° C to convert the molybdenum present to sodium molybdate, subjecting the baked spent catalyst to the action of carbon dioxide gas in a quantity of the order of 1 Nm^3 for 50 to 100 kg of catalyst and at a temperature close to ambient temperature, washing the carbon dioxide treated catalyst with water to form an alkaline solution, neutralizing and clarifying with concentrated nitric acid to convert the sodium molybdate to molybdic acid.

4,075,279

PROCESS FOR THE MANUFACTURE OF SWELLABLE CELLULOSE ETHERS

Arno Holst, and Michael Kostrzewa, both of Wiesbaden, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Sept. 23, 1976, Ser. No. 726,000

Claims priority, application Germany, Sept. 27, 1975, 2543187

Int. Cl.[2] C08B *11/00, 15/10*

U.S. Cl. 536—88 **3 Claims**

1. In the process for the manufacture of water-absorbing, but largely water-insoluble cellulose ethers, wherein cellulose is etherified with a halogen fatty acid in an alkaline medium to which organic solvents may be added, to such an extent that without a further reaction a water-soluble cellulose ether would be produced, and wherein, prior to, during, or after etherification, said further reaction is carried out with a cross-linking agent which is polyfunctional towards cellulose in an alkaline reaction medium,

the improvement comprising that chips of regenerated cellulose film are used as cellulose.

4,075,280

PREPARATION OF IMPROVED ZEOLITES

Robert Charles Fitton, Bel Air, and Barbara Ann Fiore, Baltimore, both of Md., assignors to J. M. Huber Corporation, Locust, N.J.

Filed Sept. 28, 1976, Ser. No. 727,822

Int. Cl.[2] C01B *33/28*

U.S. Cl. 423—118 **19 Claims**

1. A method for the production of improved zeolite A products which comprises reacting a calcined kaolin clay in a first digestion stage with a source of alkali metal in aqueous solution, the amount of alkali metal in the first digestion stage being about 15–40 wt. % of the total weight of alkali metal to be contained in the final zeolitic batch composition comprising the zeolite A product and liquid phase mother liquor, the digestion step being conducted at a temperature of about 40°–65° C and under conditions of high shear, said high shear comprising high dispersive agitation which has sufficient magnitude and intensity to establish high shear zones and intense turbulence and maintain each crystal in a discrete, segregated condition, thereafter gradually increasing the temperature of the resulting mixture to the range of about 80°–100° C while maintaining said conditions of high shear and adding the remaining 60–85 wt. % of the alkali metal to be contained in the final zeolitic batch composition while continuing the conditions of high shear, thereafter permitting the resulting mixture to cool and recovering the zeolitic A product from the mixture by separation from the mother liquor.

4,075,281

PURIFICATION OF CARBONATE PROCESS SOLUTIONS

Eugene Baker Port, Green River, Wyo., and Norman Rutledge Garofano, Syracuse, N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 146,443, May 24, 1971, Pat. No. 3,927,175, which is a continuation of Ser. No. 771,598, Oct. 29, 1968, abandoned. This application May 28, 1975, Ser. No. 581,467

The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.

Int. Cl.[2] C01D *7/26;* **B01D** *15/06*

U.S. Cl. 423—206 T **3 Claims**

1. A process for the reduction of soluble organic contaminants in a carbonate process solution which comprises passing said process solution through a bed of activated carbon particles until the adsorption efficiencies of said bed for the removal of said organic contaminants is reduced to at least 75% of the original adsorptive capacity of the activated carbon bed prior to regeneration, regenerating said bed by subjecting said bed to an aqueous wash cycle which comprises passing an aqueous wash liquor through said bed until at least 60% of said adsorbed organic contaminants have been desorbed, wherein the flow rates of the aqueous wash liquor are periodically randomly varied from flow rates insufficient to effect reorientation of the carbon bed particles to flow rates sufficient to effect volume bed expansion up to about 75% of the static bed volume and said aqueous wash liquor has an organic contaminant level lower than the carbonate process solution and said aqueous wash liquor is maintained at a temperature between 50° and 95° C.

4,075,282

PROCESS FOR IMPREGNATING ACTIVE CARBON WITH IODINE COMPOUNDS

Klaus Storp, Frankfurt am Main; Hans Wirth, Bad Vilbel; Günter Rittinger, Karben, and Volker Hohmann, Frankfurt am Main, all of Germany, assignors to Laboratorium fur Adsorptionstechnik GmbH, Frankfurt am Main, Germany

Filed Jan. 22, 1976, Ser. No. 651,350

Claims priority, application Germany, Feb. 22, 1975, 2507672

Int. Cl.[2] C01B *17/16, 17/00;* **B01J** *27/06, 21/18*

U.S. Cl. 423—230 **4 Claims**

1. A process for the removal of sulfur dioxide or hydrogen sulfide from a gas stream which comprises the steps of:

a. impregnating in a static state an active-carbon bed with an aqueous solution containing iodine or a water-soluble iodide salt and a reducing agent soluble in said solution and selected from the group which consists of sulfur dioxide, alkali metal sulfites, alkali metal hydrogen sulfites and hydrazine, the quantity of said reducing agent being at least the equivalent of the reducing capabilities of 3 grams of SO_2 per liter; and

b. thereafter passing said gas through the impregnated bed.

4,075,283

SELECTIVE REMOVAL OF NITROGEN OXIDES FROM WASTE GASES CONTAINING SULFUR OXIDES

Tatsuo Shiraishi; Shinkichi Shimizu, and Tadashi Shindo, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed July 25, 1974, Ser. No. 491,760
Claims priority, application Japan, Feb. 1, 1974, 49-13829
Int. Cl.[2] B01J *8/00;* C01B *21/00*
U.S. Cl. 423—239 11 Claims

1. A process for the selective removal of nitrogen oxides from waste gases containing 20 ppm or more in gas volume of sulfur oxides a portion of which is sulfur trioxide and 1,500 ppm or less of nitrogen oxides, which comprises contacting said waste gases with ammonia in the amount of 0.3 to 4 moles of ammonia per 1 mole of nitrogen oxides contained in said waste gases in the presence of a catalyst consisting essentially of metal oxides consisting of vanadium oxide and at least one member selected from the group consisting of molybdenum oxide and tungsten oxide as the active component for the reduction of nitrogen oxides with ammonia and α-alumina having a specific surface area of 0.3 to 12 m^2/g and a pore volume of 0.1 cm^3/g or more as a carrier wherein the atomic ratio of the vanadium, molybdenum, tungsten and aluminum contained in the carrier alumina is:

$$V_{12-x-y}MO_xW_yAl_z$$

wherein $0 \leqq x \leqq 8$, $0 \leqq y \leqq 5$, $0.3 \leqq x + y \leqq 8$ and $40 \leqq z \leqq 480$, at a temperature of 150° to 700° C. and at a space velocity of 2,000 to 100,000 hr^{-1}, said catalyst having the property of resisting deterioration by the sulfur oxides contained in said waste gases.

4,075,284

PROCESS FOR THE REMOVAL OF SULFUR OXIDES BY THE USE OF ACTIVATED ALUMINA

Arthur F. Johnson, Franklin Lakes, N.J., assignor to R.C.M. Corporation, Los Angeles, Calif.

Division of Ser. No. 483,129, June 26, 1974, Pat. No. 3,955,969. This application Jan. 28, 1976, Ser. No. 653,260
The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.
Int. Cl.[2] C01B *17/00;* B01J *8/00;* C01C *3/00;* C01B *17/48*
U.S. Cl. 423—244 14 Claims

1. The process for sorbing sulfor compounds from hot gases on activated alumina produced from dross containing aluminum particles, alumina and impurities comprising:

charging said dross onto a layer of molten halides underlain by a layer of molten aluminum in a holding fernace, whereby a portion of the aluminum entrained within the dross enters the aluminum layer and the alumina and impurities are entrained in the halide flux layer;

separating said dross from said molten aluminum;

digesting said dross with hot water to at least partially dissolve soluble impurities and decompose insoluble impurities;

separating remaining aluminum particles and the purified alumina from said water as separate fractions; and

drying said alumina to produce an activated alumina,

pelletizing said activated alumina; and

sorbing sulfur oxides from hot gases onto the pellets so formed.

4,075,285

RUBBER-MODIFIED POLYSTYRENE RESIN COMPOSITION

Minoru Tabana, Suita; Shizuo Narisawa, Ichihara; Tatsuyuki Mitsuno, Toyonaka, and Hiroshi Maki, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, osaka, Japan

Filed Mar. 3, 1975, Ser. No. 554,524
Claims priority, application Japan, Mar. 9, 1974, 49-27405
Int. Cl.[2] C08L *53/02*
U.S. Cl. 260—876 B 4 Claims

1. A resin composition consisting essentially of a rubber modified polystyrene which is obtained by mechanically mixing a rubbery substance selected from the group consisting of polybutadiene, and styrene-butadiene with polystyrene or by graft-copolymerizing styrene with said rubbery substance and a transparent styrene-butadiene block copolymer containing 65 to 95% by weight of styrene and 5 to 35% by weight of butadiene, wherein the ratio of said rubber-modified polystyrene to said styrene-butadiene block copolymer is in the range from 0.5 : 99.5 to 15 : 85 by weight.

4,075,286

PREPARATION OF BLOCK POLYMERS USING POLYAZO SEQUENTIAL FREE RADICAL INITIATORS

Ronald Edward MacLeay, Williamsville, and Chester Stephen Sheppard, Tonawanda, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 234,377, March 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 752,752, Aug. 15, 1968, Pat. No. 3,649,614. This application May 30, 1974, Ser. No. 474,739
Int. Cl.[2] C07C *107/02, 107/04;* C08L *51/00, 53/00*
U.S. Cl. 260—877 4 Claims

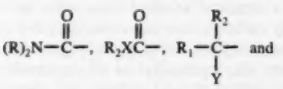
1. A process for preparing a block copolymer which comprises (a) forming a polymer having azo functions present by reacting vinyl polymer and a polyazo compound under vinyl polymerization conditions controlled to cause one type of azo function to rupture leaving the other type or azo function intact, said rupture having the effect of initiating polymerization of said vinyl polymer; and (b) reacting vinyl monomer with the polymer step (a) under conditions to rupture the azo function of said step (a) polymer to produce a block copolymer, said polyazo compound having the formula

$$, (C{-}N = N{-}A{-}B{-}A'{-}N_n(N{-}C')_{2-n}$$

where:

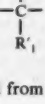
(a) $n = 1$ or 2;

(b) C and C′ are different unless—A—B—A′—is unsymmetrical and are selected from

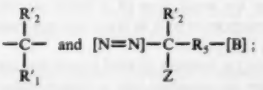


aryl of 6–14 carbons;

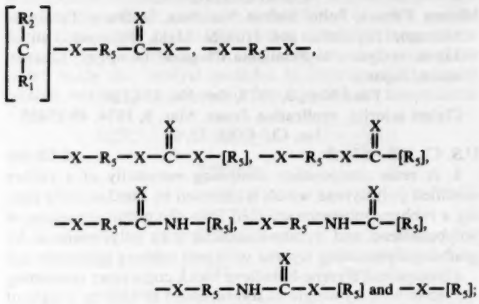
(c) A and A′ are the same or different, at least one being



and the other being selected from

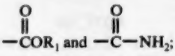


(d) B is selected from

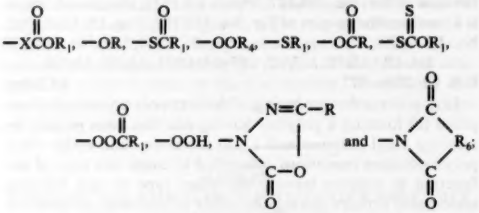


(e) X is sulfur or oxygen;

(f) Y is selected from lower alkyl of 1–4 carbons, —CN,



(g) Z is selected from—CN, —Cl,—Br, —N_3, —XCN, —R_1,



(h) R is selected from hydrogen, lower alkyl of 1–6 carbons and aryl of 6–14 carbons;

(i) R_1 and R'_1 are the same or different and are selected from alkyl of 1–8 carbons, cycloalkyl of 3–10 carbons, aralkyl of 7–12 carbons and aryl of 6–14 carbons;

(j) R_2 and R'_2 are the same or different and are alkyl of 1–10 carbons or cycloalkyl of 3–10 carbons;

(k) R_1 and R_2, R'_2 and R_5 and R'_1 and R'_2 when taken together with the tertiary carbon linked to the azo group, form a cycloalkyl of 4–12 carbons;

(l) R_4 is tertiary-alkyl of 4–8 carbons;

(m) R_5 is a diradical selected from alkyl of 1–12 carbons terminated by carbon atoms and containing 0–1 carbonyls and 0–4 nonadjacent oxygen, sulfur and nitrogen atoms in its backbone structure, alkylcycloalkyl or alkylcycloalkylalkyl of up to 12 carbons aralkyl of 7–12 carbons and phenyl; and

(n) R_6 is selected from lower akylene and cycloalkylene of 2–10 carbons, and an aromatic radical of 6–12 carbons.

4,075,287

SEPARATION PROCESS

Jack S. Scoggin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

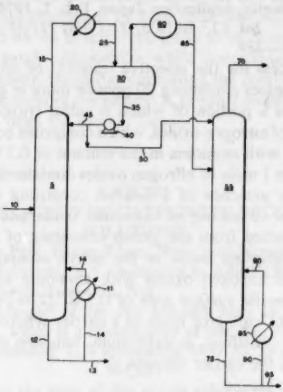
Filed Oct. 27, 1976, Ser. No. 735,911
Int. Cl.[2] C08F *297/08, 6/00;* B01D *3/00, 3/10*
U.S. Cl. 260—878 B **10 Claims**

1. A process for separation of a vapor stream containing a condensible component and at least one noncondensible component which comprises:

(a) condensing a portion of said vapor stream and allowing said stream to separate into a vapor phase and a liquid phase;

(b) introducing said liquid phase onto the top tray of a fractionation zone;

(c) compressing said vapor phase to a pressure sufficient to permit its entry into the fractionation zone and introducing same into said fractionation zone, below the point of



introduction of said liquid phase and subjecting said liquid phase and vapor phase therein to such distillation conditions including temperature and pressure as to cause a separation of said phases into an overhead comprising mainly said noncondensible component and said bottoms comprising essentially said condensible component.

4,075,288

VIBRATION-DAMPING MATERIAL

Bernard Jacques Graveron, Lyon, and Alain Jacques Essel, Calvine, both of France, assignors to Monsieur Jean Gole, France

Filed Dec. 10, 1974, Ser. No. 531,326
Claims priority, application France, Dec. 20, 1973, 73 45839
Int. Cl.[2] C08L *9/00*
U.S. Cl. 260—879 **1 Claim**

1. A vibration-damping material which comprises polyisoprene in which the total percentage of 1,2- and 3,4-vinyl structure is 75% and the temperature maximum of tan δ at 110 Hz is in the range between 0° and 23° C, the polyisoprene is in the form of a block copolymer, wherein the block copolymer is of polybutyl methacrylate, polyisoprene and polybutyl methacrylate in the weight proportion 20-60-20.

4,075,289

CHLORINATED, HYDROGENATED POLYBUTADIENE IMPACT MODIFIERS FOR PVC

John Carl Falk, Chicago, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 22, 1976, Ser. No. 743,825
Int. Cl.[2] C08F *8/22, 8/04*
U.S. Cl. 260—890 **3 Claims**

1. A thermoplastic composition comprising a blend of from about 95 to about 80 wt% of polyvinyl chloride and correspondingly from about 5 to about 20 wt% of a chlorinated polymer, said polymer being a fully hydrogenated polymer selected from the group consisting of hydrogenated homopolymers of 1,3-butadiene having greater than 30% 1,2-polymerized units and hydrogenated copolymers thereof containing up to 60 wt% styrene, said chlorinated polymer containing from 15 to 40 wt% chlorine.

4,075,290

HEAT SEALABLE POLYBUTENE-1 BLENDS CONTAINING POLYPROPYLENE OR ETHYLENE COPOLYMER

Horst Denzel, and Otto Hahmann, both of Marl, Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

Filed July 12, 1973, Ser. No. 378,689
Claims priority, application Germany, July 12, 1972, 2234103
Int. Cl.[2] C08L 23/16, 23/12
U.S. Cl. 260—897 A 6 Claims

1. A composition of matter consisting essentially of an intimate admixture of:

(a) 85–95 weight percent of an at least 95% isotactic polybutene-1 having a density of 0.914–0.919 and a solution viscosity molecular weight of 650,000–1,500,000; and

(b) correspondingly 15–5 weight percent of a low pressure ethylene copolymer with 1–3 weight percent of propylene or butene-1 having a density of 0.931–0.937 and a solution viscosity molecular weight of 75,000–140,000.

4. A composition of matter consisting essentially of an intimate admixture of:

(a) 85–95 weight percent of an at least 95% isotactic polybutene-1 having a density of 0.914–0.919 and a solution viscosity molecular weight of 650,000–1,500,000; and

(b) correspondingly 15–5 weight percent of an isotactic polypropylene having a density of 0.904–0.910 and a solution viscosity molecular weight of 200,000–350,000.

4,075,291

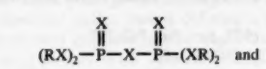
PYROPHOSPHATES

Derek Redmore, Ballwin; Benjamin T. Outlaw, Webster Groves, and Richard L. Martin, Brentwood, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 874,713, Nov. 6, 1969, abandoned. This application Jan. 16, 1976, Ser. No. 649,832
Int. Cl.[2] C07F 9/165; C02B 5/06
U.S. Cl. 260—933 8 Claims

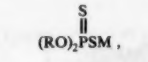
1. A mixture of compounds comprising

I. a mixture of different compounds, each having the formula



and

II. a compound or mixture of compounds, each having the formula



where R is an alkyl or oxyalkylated alkyl radical having at least 7 carbon atoms, X is oxygen or sulfur, each of said compounds in I containing both oxygen and sulfur, and the compound or mixture of compounds I being the major component of said mixture, M is hydrogen or a metal, said mixture of compounds I and II being prepared by an alcohol or a mixture of alcohols with P_2S_5 first to form O,O-disubstituted dithiophosphric acid or a mixture thereof until most of the P_2S_5 has dissolved and the evolution of H_2S has subsided and then continuing the reaction to shift the equilibrium in favor of converting dithiphosphoric acid or a mixture thereof to the pyrophosphates, with the proviso that, where M is a metal, dithiophosphoric acid or a mixture thereof is neutralized with a salt-forming base or by double decomposition.

4,075,292

PRODUCTION OF O,O-DIALKYL-PHOSPHOROCHLORIDOTHIONATES

Karl Heinz Vöpel, Kansas City, Mo.; Friedrich Hellrung, Nievenheim-Ueckerath, and Otto Berendes, Dormagen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 1, 1976, Ser. No. 691,957
Int. Cl.[2] C07F 9/146
U.S. Cl. 260—986 5 Claims

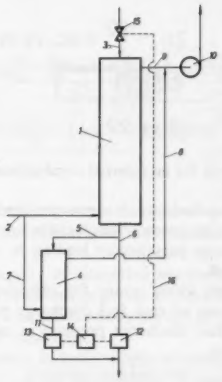
1. In the reaction of O,O-dialkyl-dithiophosphoric acid ester with chlorine to produce an O,O-dialkyl-phosphorochloridothionate, the improvement which comprises effecting the chlorination in two steps, in the first step O,O-dialkyl-dithiophosphoric acid and about one-third to two-thirds of the chlorine being continuously reacted in a first stage at a temperature of about 30° to 60° C, material from the first stage along with the balance of the chlorine being continuously supplied to a second stage of the first step maintained at a temperature of about 10° to 25° C, with formation of a clear solution containing the desired product plus by-product di-(O,O-dialkyl-thionophosphoryl) disulfide and disulfurdichloride, the by-products formed in the first step reacting with each other in the second step at about 0° to 100° C with precipitation of sulfur and formation of further quantities of the desired product.

4,075,293

CONTROL SYSTEM FOR AN ABSORPTION COLUMN

Michael Grill, Leoben; Helmut Grohmann, and Franz Nössler, both of St. Jakob near Mixnitz, all of Austria, assignors to Veitscher Magnesitwerke-Actien-Gesellschaft, Vienna, Austria

Filed Aug. 19, 1976, Ser. No. 716,012
Claims priority, application Austria, Aug. 26, 1975, 6579/75
Int. Cl.[2] G01N 9/36, 21/08, 21/12, 21/48
U.S. Cl. 261—20 21 Claims



1. A control system for an absorption column for absorbing a gaseous fluid in a liquid flowing through the column, comprising

a. inlet means for the gaseous fluid and the liquid, the inlet means including

1. an inlet for the gaseous fluid and

2. an inlet for the liquid,

b. an outlet for the liquid having said gaseous fluid absorbed therein,

c. a gage in the outlet for measuring a parameter which is a function of the amount of said gaseous fluid absorbed in the liquid and producing an output signal corresponding to said parameter,

d. an auxiliary absorption column of a substantially smaller capacity than that of the absorption column,

e. an inlet means for delivering the gaseous fluid and the

liquid to the auxiliary absorption column, said inlet means including

1. an inlet for the gaseous fluid arranged to deliver a small amount of the gaseous fluid to the auxiliary absorption column as compared to the amount of the gaseous fluid delivered through the inlet for the absorption column and
2. an inlet for the liquid, the gaseous fluid being delivered in substantial excess over the absorptive capacity of the gaseous fluid by the liquid,

f. an outlet from the auxiliary absorption column for the liquid having the gaseous fluid absorbed therein,

g. another gage in the outlet from the auxiliary absorption column for measuring a parameter which is a function of the amount of said gaseous fluid absorbed in the liquid coming from the auxiliary absorption column and producing an output signal corresponding to this parameter,

h. a comparator having input means and an output, the input means being connected to the gages for receiving the output signals thereof, the output signals being compared in the comparator and the comparison producing a control signal at the output of the comparator, and

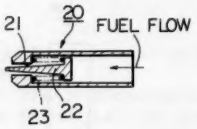
i. a flow control in the inlet means of the absorption column connected to the output of the comparator and being controlled by the control signal.

4,075,294

CARBURETOR ACCELERATING FUEL CIRCUIT MEANS

Masaaki Saito, No. 5-25-11, Iwato, Yokosuka, and Kenji Okamura, No. 3-5-20, Nakahara, Isogo, Yokohama, both of Japan

Filed Mar. 1, 1977, Ser. No. 773,350
Claims priority, application Japan, Mar. 19, 1976, 51-30581
Int. Cl.[2] F02M *7/08*
U.S. Cl. 261—34 A **6 Claims**



1. A carburetor for an internal combustion engine comprising:

an accelerating fuel circuit means for feeding fuel to an air induction passage upon acceleration conditions through a fuel discharge passageway leading to the air induction passage; and

a flow control valve means for reducing effective cross sectional area of said fuel discharge passageway in response to fuel discharge pressure in said fuel discharge passageway.

4,075,295

WATER FILM FORMING INSTALLATION

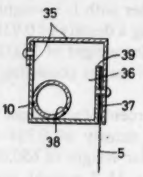
Eisuke Funakoshi, No. 1119-5, 1-chome, Hojo, Daito, Osaka, Japan

Continuation-in-part of Ser. No. 595,589, July 14, 1975, abandoned. This application June 7, 1976, Ser. No. 693,472
Claims priority, application Japan, Apr. 11, 1975, 50-50660
Int. Cl.[2] B01D *47/00*
U.S. Cl. 261—36 R **1 Claim**

1. A water film forming installation wherein air is shut out by a constant film of water, comprising in combination:

a. a first water supply conduit (**10**) having a plurality of nozzles (**38**) therein spaced from each other;

b. first and second enclosing members (**35**) with vertical side plates, the first member with a U-shape cross-section the second member with an inverted U-shape cross-section, one of the vertical side plates on each member being the taller side plate and substantially the same height as the corresponding one side plate on the other member, the other side plate on each member being of shorter height, the shorter heighth side plate on the first member being taller than the corresponding shorter heighth side plate on the second member, the first member being juxtapositioned under the second member, so that the side plates of the second member outwardly cover the side plates of the first member and the shorter side plate of the first member is disposed alongside and bolted to the taller side plate of the second member so that a slit (**37**) is formed between plates by said shorter side plate of the first member and the taller side plate of the second member said members defining a rectangular box-like reservoir (**36**) with lower corners, one corner being alongside said slit, the water supply



conduit (**10**) being disposed in the other lower corner, opposite said slit (**37**), so that water supplied by said nozzles (**38**) fill up said reservoir (**36**) until the water level rises above said slit and overflows it flowing down the slit;

c. a second water supply conduit (**22**) horizontally mounted right under said box-like reservoir, said second conduit (**22**) having an elongated opening (**4**), which is disposed under said box-like reservoir so as to catch said overflow;

d. a vertical net of ten to fifteen mesh Tyler stretched between said first second conduit and passing in the slit to the top of the slit so that the water overflowing said slit moves vertically down over the net shutting out the passage of air through the net; and,

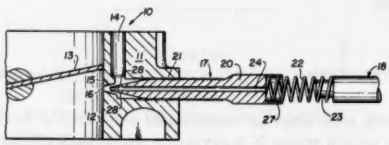
e. means for raising the water collected in said second conduit back to said first conduit.

4,075,296

IDLE SPEED NEEDLE SCREW FOR CARBURETORS

Ronald J. Orsini, 19 Shenandoah Blvd., Coram, N.Y. 11727, and Joseph Della Universita, 212 Erlanger Blvd., North Babylon, N.Y. 11703

Filed Jan. 25, 1977, Ser. No. 762,257
Int. Cl.[2] F02M *3/08*
U.S. Cl. 261—41 D **1 Claim**

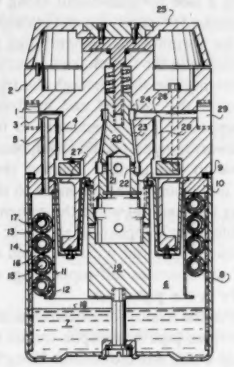


1. The combination of a carburetor having a suitable nose cone aperture in the wall of the idle system thereof and a tubular needle screw mounted therein and adapted to fit and coact with said aperture, said needle screw comprising an elongated tubular component having an exteriorly threaded cylindrical portion and a nose cone, said component having an axial passage disposed therethrough and extending to the tip of said nose cone for conducting air, and further having at least one radially disposed duct in said nose cone for conducting liquid fuel and communicating with said axial passage to produce an air-gasoline mixture within the cone prior to emerging therefrom.

4,075,297
ANESTHETIC VAPORIZER

Peter Seidel, Lubeck, Germany, assignor to Dragerwerk Aktiengesellschaft, Germany

Filed Feb. 19, 1976, Ser. No. 659,233
Claims priority, application Germany, Feb. 20, 1975, 2507262
Int. Cl.[2] A61M *17/00*
U.S. Cl. 261—104 5 Claims



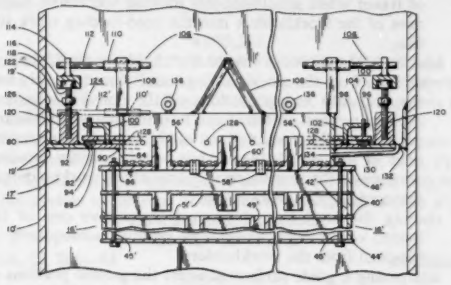
1. An anesthetic vaporizer comprising a housing, including a lateral wall, defining an interior liquid reservoir and a vaporizing chamber above said reservoir, a gas inlet into said housing, a cylindrical wick tube support barrel supported in said vaporizing chamber and spaced inwardly from the inner surface of said lateral wall of said housing, a wick barrel on the interior surface of said lateral wall, with its lower end extending into the liquid in said liquid reservoir, a spirally wound wick tube, open at both ends, disposed between said tube support barrel and said wick barrel and supported, at its lower end, solely by said wick tube support barrel, with its adjacent convolutions in contact with each other, means defining a vaporizing gas passage in said housing communicating at one end with said inlet and at its opposite end with the interior of said tube through the open upper end thereof and with the space defined between convolutions of said spirally wound wick tube, said wick barrel and said wick tube support barrel, said vaporizing gas passage providing for flow of gas from said inlet through the interior of said tube and over the exterior thereof to said reservoir, a vaporizer outlet from said housing, means defining an outlet passage connecting said vaporizer chamber to said vaporizer outlet, means defining a by-pass passage extending from said gas inlet to said vaporizer outlet, and a supporting insert in said wick tube extending completely therethrough between the open ends thereof, said supporting insert maintaining said wick tube completely open for the flow of gas therethrough.

4,075,298
CONTACT TOWERS WITH LEAK-PROOF SUPPORT OF IMPROVED PLATE SUBASSEMBLY

Max Leva, and Joseph L. Leva, both of One Hodgson Ave., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 589,906, June 24, 1975, Pat. No. 3,997,633. This application Apr. 5, 1976, Ser. No. 673,880
Int. Cl.[2] B01D *3/22*
U.S. Cl. 261—114 TC 14 Claims

1. In a gas-liquid contact tower the combination comprising a tower shell, a plurality of superimposed generally horizontal contact plates mounted in vertically spaced relation within said tower shell, said plates being grouped into at least one subassembly thereof, supporting and sealing means for removably supporting said plate subassembly within said tower shell and for preventing any of said contact liquid from bypassing said plate subassembly, said supporting and sealing means including a first annular component permanently secured and sealed to adjacent inner surfaces of said tower shell and a second annular component circumferentially joined to said plate subassembly and means movably mounting said second component to said

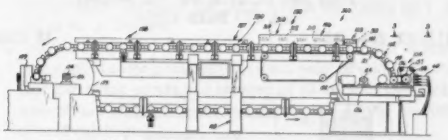


first component to enable leveling thereof and gasketing means for preventing passage of fluid between said components, said gasketing means being inserted generally between said components.

4,075,299
METHOD OF MAKING RETRACTILE CORDS

Gordon Foreman Bloxham, Baltimore; Claude Paren Brezeale, Columbia; Eugene Raymond Cocco, Baltimore; Edwin Charles Hardesty, Perry Hall; Byron Lee Small, Baltimore; Daniel Marion Steinert, Dundalk, all of Md., and Charles McGonigal, Grayson, Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 641,003, Dec. 15, 1975, Pat. No. 3,988,092.
This application July 19, 1976, Ser. No. 706,729
Int. Cl.[2] B29C *27/20*
U.S. Cl. 264—25 7 Claims



1. A method of making retractile cords each having a jacketed plurality of individual conductors, which includes the steps of:

providing a plurality of elongated workholders in spaced-apart parallel relationship to one another along a continuous path of travel substantially normal of the longitudinal axes of the workholders;

advancing a leading end of a supply of cordage into engagement with one of the workholders in registration with a cord-loading work station;

securing the leading end of the supply of cordage in engagement with each successive workholder in the cord-loading work station;

winding a plurality of convolutions of the cordage on successive ones of the workholders in registration with the cord-loading work station to form a helically wound cord on each successive workholder such that adjacent ones of the convolutions are spaced apart and the wound cord has inwardly and outwardly facing portions with respect to its associated workholder;

clamping the last wound convolution in engagement with the workholder;

severing the wound cord from the supply of cordage to form a trailing end portion extending from the workholder and a leading end portion from the supply such that the trail-

ing and leading end portions each includes jacketed conductors;

indexing each successive loaded workholder along the path of travel while simultaneously moving successive empty ones of the workholders into the cord-loading work station;

heating each successive loaded workholder to facilitate heat transfer from the workholder generally conductively into the inwardly facing portions of the convolutions, and causing radiant heat transfer into the outwardly facing portions of the convolutions of the cords on successive ones of the workholders while simultaneously winding cordage on the next successive ones of the workholders in the cord-loading work station;

cooling the cord wound on each successive one of the loaded workholders to facilitate removal subsequently of the cord from the workholder;

interposing a guide surface adjacent the wound portions of the cord on each successive one of the workholders in a cord removal work station;

twistingly rotating the ends of the helically wound cord on each successive one of the workholders in the cord removal work station relative to each other to reverse the direction of the pitch of the helices thereof; while

causing relative movement between the trailing end and the wound portion of each successive one of the wound cords to unwind the cord form the workholder with successive sections of the cord being moved past the guide surface to minimize enlargement of the convolutions; and

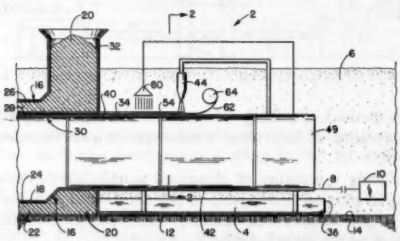
engaging unwound portions of the cord adjacent to the other end of the cord prior to the cord being unwound completely to secure the other end of the cord when the cord is unwound completely.

4,075,300

METHOD FOR PRODUCING CAST-IN-PLACE PIPE EMPLOYING PERMANENT PIPE MOLD

George M. Keller, 900 Indian Way, Novato, Calif. 94947

Filed Jan. 12, 1976, Ser. No. 648,241
Int. Cl.[2] B63B *35/04*
U.S. Cl. 264—32 **18 Claims**



1. In a method for constructing a continuous length of pipe from a deformable and hardenable material including the steps of providing an exterior form for supporting a lower portion of the pipe; providing an interior mold for supporting an upper portion of the pipe to prevent a collapse of the pipe while the material is deformable; casting the deformable material over the exterior form and the interior mold to construct homogenous, initially deformable pipe; and thereafter permitting the material to harden into a rigid, continuous length of pipe; the improvement to the step of providing the interior mold comprising the steps of providing a continuous length of a relatively thin plastic material; shaping the plastic material into a configuration to conform it to an interior surface of the upper pipe portion and so that it extends over less than the full circumferential extent of the interior pipe surface; providing a support for the plastic material in said configuration and supporting the plastic material with the support until it is substantially rigid; rendering the plastic material substantially rigid to thereby form a continuous, longitudinally extending mold; casting the deformable material about the mold; withdrawing the support from the plastic material before the deformable material has hardened; and supporting the deformable material while it is in its deformable state and until it is in its hardened state with the mold.

10. A method for the in situ formation of a long, continuous length of cementitious pipe in an open trench comprising the steps of providing a sled for movement along the trench, the sled having an intake for receiving deformable cementitious material, means for forming the cementitious material into a lower pipe half resting in the trench, and an upwardly convex, rigid mandrel; drawing the sled through the trench; flowing a plastic material over the mandrel and hardening the plastic material while supported by the mandrel to form a substantially rigid, downwardly open plastic mold; retaining the mold stationary relative to the trench; pouring the cementitious material into the intake and over the mold to thereby cast the pipe; withdrawing the mandrel while the cementitious material is in its deformable state; supporting an upper half of the deformable cementitious material with the mold only until such material hardens and becomes self-supporting; and leaving the mold permanently in the pipe.

17. A method for the in situ formation of a long, continuous length of cementitious pipe in an open trench comprising the steps of providing a sled for movement along the trench, the sled having an intake for receiving deformable cementitious material, means for forming the cementitious material into a lower pipe section resting in the trench, and an upwardly convex, rigid mandrel; drawing the sled through the trench to thereby move the forming means and the mandrel relative to the trench for forming the cementitious material into an upper pipe section; forming on the mandrel a downwardly open mold; hardening the mold while the upper pipe section is supported by the mandrel; pouring the cementitious material into the intake to thereby form the lower pipe section and an upper pipe section with the forming means and the mandrel, respectively; maintaining the pipe sections stationary relative to the trench, whereby the forming means and the mandrel move relative to the pipe sections and the freshly formed upper pipe section is initially supported by the mandrel and thereafter becomes unsupported by said mandrel; withdrawing the mandrel while the cementitious material is not self-supporting; continuing to support cementitious material of the upper pipe section with the mold after the mandrel is withdrawn therefrom until the cementitious material hardens and becomes self-supporting; and leaving the mold permanently in the hardened pipe.

4,075,301

METHOD AND APPARATUS FOR DEPOSITING MATERIAL INTO A MOVING RECEPTACLE

Leo Alex Oswald, Huntingdon, Pa., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 22, 1976, Ser. No. 651,308
Int. Cl.[2] B29C *1/00, 3/00, 5/10*
U.S. Cl. 264—40.7 **18 Claims**

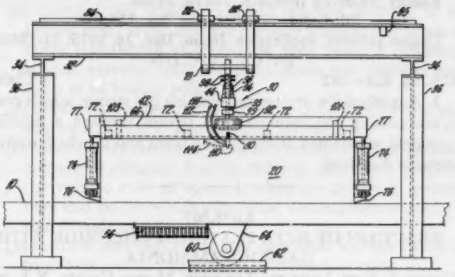
1. Apparatus for depositing material in a moving receptacle, comprising:

a. means for moving a receptacle in a path other than a straight line,

b. means for moving a discharge means for depositing a material in said moving receptacle, said means for moving said discharge means being adapted to maintain a predetermined movement of said discharge means relative said moving receptacle;

c. means for continuously sensing movement of said receptacle during said depositing of said material; and

d. control means responsive to said sensing means to control movement of said discharge means in a predetermined



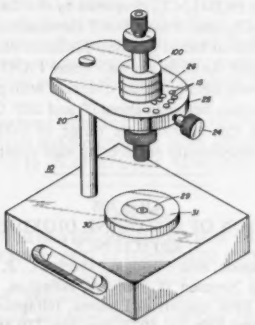
pattern of speeds relative to movement of said receptacle whatever the movement of said receptacle.

4,075,302

APPARATUS FOR GRIPPING AND HOLDING SMALL WORKPIECES

John K. Brady, and Robert Noyes, both of Champaign, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed June 13, 1977, Ser. No. 805,920
Int. Cl.[2] B25B *1/10*
U.S. Cl. 269—43 5 Claims



1. Apparatus for gripping and holding a plurality of relatively small flat chips by the edges thereof, comprising, in combination:

an elevated support member having a top surface which defines a table, said member having an aperture therein;

a support flange extending inwardly from said aperture a predetermined distance below said table surface; and

a gripping assembly removably mountable in the aperture in said support member, said assembly including:

a first gripping member having a periphery corresponding to the contour of said aperture and having a thickness at its periphery which corresponds to said predetermined distance;

a second gripping member having a periphery at least a portion of which has a contour that corresponds to the periphery of said first gripping member;

resilient spacer means disposed between said first and second gripping members and being operative to normally bias the peripheries of said gripping members slightly apart; and

means fo temporarily squeezing said gripping members together;

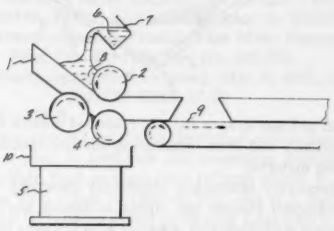
whereby when said gripping assembly is mounted in said support member and seated on said flange, chips placed on the table surface can be manually moved to positions where their edges are between the spaced peripheries of said gripping members, whereupon activation of said squeezing means causes gripping and holding of the chip edges by said gripping assembly.

4,075,303

METHOD OF PREPARATION OF CERAMIC FOAM

John C. Yarwood, Madison, Conn.; James E. Dore, Ballwin, Mo., and Robert K. Preuss, Middletown, Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation-in-part of Ser. No. 589,294, June 23, 1975, which is a continuation-in-part of Ser. No. 563,213, March 28, 1975, Pat. No. 3,962,081. This application Feb. 22, 1977, Ser. No. 770,395
The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.
Int. Cl.[2] B29H *7/20*
U.S. Cl. 264—44 20 Claims



1. A method of preparing a ceramic foam possessing controlled permeability and structural uniformity which comprises:

A. providing a hydrophobic, reticulated organic polymer foam possessing a predetermined permeability and resilience;

B. preparing an aqueous slurry of a thixotropic ceramic composition having a viscosity within the range of 1×10^3 to 80×10^3 cps;

C. providing at least three rolls mounted to furnish at least two gaps in close proximity between pairs of said rolls, the first gap being preset at a spacing of 50–90% of the thickness of said polymer foam and the second gap at 70–90% of said thickness;

D. passing said polymer foam through said roll gaps while flowing said slurry over at least one roll and a surface of said polymer foam to establish a supply of said slurry at the entrance to said first gap, thereby uniformly impregnating said polymer foam with said slurry; and

E. drying and heating said impregnated foam to remove the organic component therefrom.

4,075,304

METHOD OF MAKING FOAM FILLED PANELS

Lawrence A. Watson, Sebring, Fla., assignor to Edgewater Marine, Inc., Sebring, Fla.

Filed Jan. 29, 1976, Ser. No. 653,440
Int. Cl.[2] B29D *27/04;* B29C *5/00*
U.S. Cl. 264—46.5 5 Claims

1. A batch method of making a foam filled panel comprising:

placing a first sheet in a generally stationary position;

said first sheet having turned edges around its margin;

placing against said first sheet a second flexible sheet adapted to rest at said marginal edges;

selectively clamping marginal edges of said sheets together at one end thereof with individual clamps placed at laterally opposed marginal edges of said sheets;

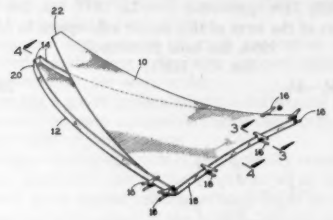
spreading said sheets apart from the opposite end thereof so that a hollow, closed space is formed between said sheets where so clamped;

after said spreading, introducing foamable material into said

hollow space while causing said foamable material to foam so as to fill said hollow space at least partially and then terminating the introduction of foamable material;

while continuing to clamp said sheets at said one end, further selectively clamping laterally opposed marginal edges of said sheets adjoining said one end with additional individual clamps to extend said closed, hollow space;

after said further clamping, introducing foamable material into said extended hollow space while causing said material to foam so as to fill said extended hollow space at least partially and then terminating the introduction of foamable material;



progressively alternately selectively clamping with further additional clamps and filling adjoining portions of said sheets with foamable material which foams therein until a foam filled panel is formed; and

keeping said sheets substantially stationary at a fixed location during the foregoing clamping and filling steps.

4,075,305

CONTINUOUS PROCESS FOR THE MANUFACTURE OF PHOSPHORIC ACID USING PROCESS WATER

Jean-Francois Gielly, Rouen, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Nov. 2, 1976, Ser. No. 738,141

Claims priority, application France, Nov. 4, 1975, 75 33657

Int. Cl.[2] C01B *25/16*

U.S. Cl. 423—320 **10 Claims**

1. A process for the manufacture of phosphoric acid comprising the steps of continuously:

introducing phosphate ore and sulfuric acid into a reaction zone;

reacting the contents of said reaction zone in a circulating cooling air environment which results in the cooling air becoming heated;

removing calcium sulfate slurry containing phosphoric acid produced by the reaction in said reaction zone to a filtering zone;

separating said phosphoric acid from said calcium sulfate containing slurry in said filtering zone;

removing gases produced by the reaction and evaporated into said heated circulating cooling air in said reaction zone;

scrubbing said heated cooling air containing said evaporated gases in a scrubbing zone with process water to remove the recoverable gases from said cooling air into a solution and thereby purifying said air so that said process water is heated;

recovering said heated solution and introducing at least part of said heated solution into said filtering zone and the remainder of said solution into said reaction zone;

washing said calcium sulfate in said filtering zone with said heated solution introduced to said filtering zone by methodic washing techniques; and

introducing said solution from said filtering zone into said reaction zone.

4,075,306

METHOD FOR DRYING AN AMMONIA GAS STREAM

Tadasumi Muromura, Tokai, Japan, assignor to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Oct. 19, 1976, Ser. No. 733,903

Claims priority, application Japan, Dec. 26, 1975, 51-156280

Int. Cl.[2] C01C *1/00*

U.S. Cl. 423—352 **5 Claims**

1. A method for drying an ammonia gas stream which comprises passing the ammonia gas stream through a liquified ammonia maintained at the boiling point and in which sodium metal is dissolved.

4,075,307

REACTION OF BETA PLATINUM CHLORIDE WITH GASEOUS AMMONIA

George T. Kerr, Lawrence Township, Mercer County, N.J., and Albert E. Schweizer, Levittown, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 532,445, Dec. 13, 1974, abandoned. This application Apr. 28, 1976, Ser. No. 680,960

Int. Cl.[2] C01B *21/00*; C01G *55/00*

U.S. Cl. 423—413 **3 Claims**

1. A method for preparing a complex having the formula:

$$PtCl_2 \cdot X\ NH_3$$

in which ammonia is irreversibly reacted and where X is a number greater than 0 but not greater than essentially 2; and when X is 1, the composition has an X-ray diffraction pattern which is the same as beta platinum chloride and distinct from the monoamine $Pt(NH_3)Cl_2$, prepared by the decomposition of trans $Pt(NH_3)_2Cl_2$; and when X is 2 the composition is amorphous in contrast to the crystalline platinum compounds having the empirical formula cis and trans $Pt(NH_3)_2Cl_2$; which comprises reacting beta platinum chloride with gaseous ammonia at a temperature between about 0° and 200° C. at an ammonia pressure in the approximate range of 0.05 to 0.3 atmospheres, and subsequently recovering said complex.

4,075,308

PRODUCTION OF CHLORINE DIOXIDE AT HIGH EFFICIENCY

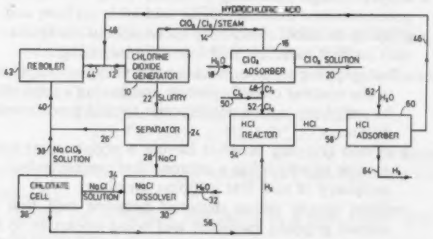
W. Howard Rapson, Scarborough; Maurice C. J. Fredette, Mississauga, and Norman W. Meyers, Islington, all of Canada, assignors to Erco Industries Limited, Islington, Canada

Filed Feb. 22, 1977, Ser. No. 770,359

Claims priority, application United Kingdom, Feb. 24, 1976, 7188/76; Aug. 24, 1976, 35159/76

Int. Cl.[2] C01B *11/02*; C01D *3/04*; C01B *1/02, 7/01*

U.S. Cl. 423—478 **10 Claims**



1. In a method of producing chlorine dioxide from sodium chlorate, which comprises:

(a) establishing in a reaction zone an aqueous reaction medium containing dissolved quantities of sodium chlorate, sodium chloride and hydrochloric acid, said aqueous reaction medium being substantially saturated with sodium chloride,

(b) continuously feeding an aqueous solution of sodium chlorate to said aqueous reaction medium,
(c) continuously feeding hydrochloric acid or hydrogen chloride to said aqueous reaction medium,
(d) continuously maintaining said reaction medium at its boiling point at the absolute pressure thereon and continuously maintaining said reaction zone under a subatmospheric pressure sufficient to maintain said reaction medium at its boiling point,
(e) continuously generating chlorine dioxide, chlorine and sodium chloride in said reaction medium,
(f) continuously removing from said reaction zone a gaseous mixture of chlorine dioxide, chlorine and steam wherein the volume ratio of steam to chlorine dioxide is greater than that below which substantial decomposition of chlorine dioxide occurs,
(g) continuously depositing said generated sodium chloride from said reaction medium in said reaction zone,
(h) removing said deposited sodium chloride from said reaction zone, and
(i) continuously maintaining the volume of liquid in said reaction zone substantially constant,
the improvement which comprises:
(j) continuously feeding said aqueous solution of sodium chlorate to said aqueous reaction medium in sufficient quantity to maintain a concentration of sodium chlorate in said reaction medium substantially saturating the same and to maintain said aqueous reaction medium at a mole ratio of chlorate ions to chloride ions of about 5.9:1 to about 2.1:1,
(k) continuously maintaining the actual hydrogen ion concentration in said reaction medium in the range of about 0.05 to about 0.3 normal, and
(l) continuously maintaining said boiling point of said reaction medium in the range of about 30° to about 85° C and continuously maintaining said subatmospheric pressure on said reaction zone in the range of about 20 to about 400 mm Hg,
said improvement resulting in the production of chlorine dioxide from sodium chlorate at an efficiency equivalent to about 39 to about 50 Gram Atom Percent ClO_2.

4,075,309
PROCESS FOR THE PRODUCTION OF HIGHLY CONCENTRATED MAGNESIUM CHLORIDE SOLUTIONS

Dietmar Kunze, and Siegfried Kirchner, both of Bad Salzdetfurth, Germany, assignors to Kali und Salz Aktiengesellschaft, Germany

Filed Mar. 29, 1977, Ser. No. 782,388
Claims priority, application Germany, Mar. 29, 1976, 2613289
Int. Cl.[2] C01F *5/30, 5/00;* **C01D** *3/06;* **C01F** *5/40*
U.S. Cl. 423—497 **14 Claims**

1. In a process for the production of highly concentrated magnesium chloride solutions from industrial liquors or brines which contain less than 320 g/l $MgCl_2$, and which contain significant amounts of alkali chlorides, bromides, sulfates and other impurities, wherein the production steps include evaporation to form a hot liquor which contains crystallized carnallite and sodium chloride, separation of the crystallized carnallite and sodium chloride from the hot liquor, debromination of the resultant hot liquor by means of chlorine, neutralization, cooling and separation of crystallizates and impurities, the improvement which comprises:
a. evaporating an industrial liquor or brine in two or more stages under a vacuum and in a counter current evaporator with crystallization characteristics up to a final concentration of 440 to 475 g/l $MgCl_2$, a solid substance content of 12 to 25% by weight and final temperatures of 95° to 105° C;
b. separating the resulting hot liquor, together with magnesium sulfates and other impurities which are contained therein, from the crude crystallized carnallite and sodium chloride, said resulting hot liquor containing magnesium sulfate and other impurities in a finely dispersed form which renders them easily separable from the crude crystallized carnallite and sodium chloride;
c. debrominating said resulting hot liquor by oxidation by the addition of chlorine;
d. neutralizing the debrominated liquor while in the hot state with lime or dolomite milk;
e. removing from the hot neutralized liquor any solid substances formed during said neutralizing step;
f. cooling the hot neutralized liquor to room temperature while crystallizing additional carnallite and sodium chloride; and
g. separating the crystallized carnallite and sodium chloride from a concentrated magnesium chloride product solution containing 400 to 465 g/l of $MgCl_2$.

4,075,310
PRODUCTION OF SULFUR BY THE CLAUS PROCESS

Herbert Fischer, Lollar, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 19, 1976, Ser. No. 659,351
Claims priority, application Germany, Mar. 8, 1975, 2510240
Int. Cl.[2] C01B *17/04*
U.S. Cl. 423—574 R **4 Claims**

1. In a Claus process for the production of sulfur from a raw gas which is poor in ammonia and consisting essentially of hydrogen sulfide, such as a gas from refinery plants, by scrubbing the gas with water to remove NH_3 and H_2S therefrom, separating the NH_3 and H_2S and producing a gas stream rich in H_2S and another gas stream rich in NH_3, subjecting the first and the second gas streams separately to combustion and cooling the combustion gases, the improvement which comprises:
(a) scrubbing the H_2S and NH_3-containing raw gas which is saturated with water vapor in two stages consisting of a bottom stage and a top stage, recirculating the scrubbing water repeatedly through only said bottom stage to remove most of the NH_3 from the raw gas in order to reach a high absorption rate and thereafter finally scrubbing the raw gas with fresh water in an open circuit in the top stage whereby the latter water then passes into the bottom stage without recirculation to remove the remainder of the NH_3 therefrom to a residual content of less than 100 ppm NH_3 and dissipating the heat of reaction and solution by a heat exchanger supplied with coolant;
(b) deriving a gas rich in H_2S and containing less than 100 ppm of NH_3 therein;
(c) driving H_2S from the scrubbing water of step (a) liberated from H_2S and cooling the formed NH_3 and forming a second gas rich in HH_3;
(d) recirculating the scrubbing water which is free of H_2S and NH_3 to the top of the bottom stage of the scrubbing column; and
(e) feeding the first mainly H_2S-containing gas and the second mainly NH_3-containing gas streams of steps (b) and (c) respectively into the same Claus plant furnace with temperatures of below 40° C and burning said gases separately with air or oxygen, the second gas being burned with an excess of oxygen to maintain a ratio of H_2S/SO_2 at a value of about 2 to 1 to produce elemental sulfur therefrom.

4,075,311
PROCESS FOR PREPARING GRANULATED MAGNESIUM HYDROXIDE AND MAGNESIA OF A LARGE SPECIFIC SURFACE

Peter Eustacchio, Leoben, Austria, assignor to Veitscher Magnesitwerke-Actien-Gesellschaft, Vienna, Austria

Filed Jan. 28, 1976, Ser. No. 653,223
Claims priority, application Austria, Jan. 31, 1975, 741/75
Int. Cl.[2] C01F *5/16*
U.S. Cl. 423—636 **33 Claims**

1. A process for preparing insulation magnesium hydroxide,

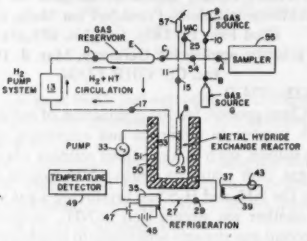
comprising the steps of adding to a mass of finely divided magnesia an amount of water sufficient to act as a binding agent for the finely divided magnesia granulating the mass to form granules and subjecting the granules to an exothermic hydration reaction for hydrating at least 50%, by weight, of the magnesia with the added water.

4,075,312

PROCESS FOR RECOVERING EVOLVED HYDROGEN ENRICHED WITH AT LEAST ONE HEAVY HYDROGEN ISOTOPE

John Tanaka, Storrs, Conn., and James J. Reilly, Jr., Bellport, N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed June 6, 1977, Ser. No. 804,124
Int. Cl.[2] C01B *4/00, 1/00;* C01G *6/24*
U.S. Cl. 423—648 A **9 Claims**



8. The process of enriching a protium atmosphere with at least one heavy hydrogen isotope, comprising the steps of:

a. alloying titanium with at least one metal selected from the group of metals consisting of V, Cr, Mn, Mo, Fe, Co and Ni having an alloy hydride hydrogen separation factor greater than one;

b. hydriding the alloy with protium;

c. selectively contacting the alloy hydride at a pressure above the dissociation pressure of the hydrided alloy with a protium treating gas containing higher than normal amounts of at least one heavy isotope of hydrogen at a temperature in the range of up to 40° C to enrich the hydrided alloy in at least said one isotope;

d. isolating the enriched hydrided alloy; and

e. decomposing the isolated enriched alloy to produce the enriched atmosphere.

4,075,313

PROCESS FOR PRODUCING HYDROGEN AND OXYGEN FROM WATER

Jon B. Pangborn, Lisle, Ill.; John C. Sharer, Farmington, Maine, and Robert H. Elkins, Hinsdale, Ill., assignors to American Gas Association, Arlington, Va.

Continuation-in-part of Ser. No. 536,014, Dec. 23, 1974, Pat. No. 3,998,942. This application Mar. 18, 1976, Ser. No. 668,138
Int. Cl.[2] C01B *1/08, 13/00*
U.S. Cl. 423—658 **17 Claims**

1. In a reactant regenerative closed cycle process for the production of hydrogen from water the steps comprising:

reacting solid ferriferrous oxide and a gaseous chloride ion yielding substance selected from the group consisting of hydrogen chloride and chlorine at temperatures of about 125° to about 300° C when hydrogen chloride is used and about 800° to about 1000° C when chlorine is used to produce ferric chloride;

thermally reducing the ferric chloride at temperatures of about 225° to about 325° C to produce ferrous chloride;

reducing the ferrous chloride to metallic iron at temperatures of about 600° C. to about 1500° C.; and

then oxidizing the metallic iron with steam at temperatures of about 600° to about 1500° C to produce hydrogen and ferriferrous oxide and recycling said ferriferrous oxide for reaction with said gaseous chloride ion yielding substance and using some hydrogen produced for reducing the ferrous chloride and removing the remainder of the hydrogen from the cycle.

4,075,314

STANNOUS PYROPHOSPHATE TECHNETIUM-99m COMPOSITIONS

Robert G. Wolfangel, Ballwin, and Howard A. Anderson, Kirkwood, both of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Apr. 29, 1976, Ser. No. 681,626
Int. Cl.[2] A61K *43/00, 29/00*
U.S. Cl. 424—1 **16 Claims**

1. An improved composition for skeletal imaging comprising,

A. divalent tin

B. technetium-99m

C. pyrophosphate, and

D. sufficient ascorbate to reduce (1) the oxidation of Sn^{+2} to Sn^{+4} during extended storage and (2) reoxidation of reduced technetium and the formation of technetium labeled impurities.

4,075,315

DETECTION OF ANTIGENS BY ANTI-BODY SENSITIZED MICROBIAL PARTICLES

Herman Ainis; Charles F. Lange, both of Evanston; Abraham S. Mark, and George H. Scherr, both of Park Forest, all of Ill., assignors to Technical Research Affiliates, Inc., Park Forest, Ill.

Filed Sept. 19, 1975, Ser. No. 614,854
Int. Cl.[2] G01N *31/02, 33/16*
U.S. Cl. 424—12 **23 Claims**

1. A method of testing for the presence of a suspected specific antigen in a biological specimen of animal origin, comprising the step of combining the specimen containing the suspected antigen with a protein-A-containing microbial cell suspension so sensitized with an antibody specific to the suspected antigen that the Fc part of the antibody is attached to protein-A which in turn is attached to the microbial cell, whereby agglutination occurs if the test is positive.

4,075,316

DENTIFRICES

Martin Cordon, Highland Park, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 561,842, March 25, 1975, Pat. No. 3,957,968, which is a continuation-in-part of Ser. No. 389,826, Aug. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 355,365, April 30, 1973, abandoned. This application Feb. 27, 1976, Ser. No. 662,068
The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.
Int. Cl.[2] A61k *7/16*
U.S. Cl. 424—49 **5 Claims**

1. A dentifrice comprising, as an abrasive, alpha-alumina which is in the form of flat flakes having an average diameter of less than about 20 microns and thicknesses of less than about 3 microns, the proportion of said alpha-alumina being above about 0.1% and less than about 60% of said dentifrice, said alpha-alumina being a component of visible agglomerated particles of a thermoplastic resin having a molecular weight between about 1000 and 100,000, said visible agglomerated particles being in the range of about 0.5 to 50 microns in size and dispersed in said dentifrice in amount of up to about 60% by weight.

4,075,317

DENTAL CREAM COMPOSITION

Robert Lee Mitchell, Somerset, and William John Chung, Spotswood, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 464,898, April 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 369,730, June 13, 1973, abandoned. This application Oct. 2, 1975, Ser. No. 618,855

Int. Cl.[2] A61K *7/16, 7/18*

U.S. Cl. 424—52 **4 Claims**

1. A dental cream suitable for compatible incorporation into an unlined aluminum container comprising a dental cream vehicle having dispersed or dissolved therein a water-soluble monofluorophosphate salt selected from the group consisting of alkali metal, calcium, magnesium and aluminum monofluorophosphates in an amount which provides between about 0.01 and 1% fluoride to said dental cream, about 35 to 60% by weight of abrasive which abrasive consists essentially of alumina in excess of calcium carbonate, said calcium carbonate being in amount of at least about 5% by weight of the total dental cream, an alkali metal tripolyphosphate in an amount of about 0.05 up to about 1.5% by weight and between about 0.05 and about 0.25 % by weight of a dissolved or dispersed silicate.

4,075,318

SKIN PROTECTIVE COMPOSITIONS

Ralph Kelly, Cincinnati, and Edmond Jean Ritter, Loveland, both of Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 696,509, Jan. 9, 1968, Pat. No. 3,630,934, which is a continuation-in-part of Ser. No. 613,095, Feb. 1, 1967, Pat. No. 3,538,009. This application June 15, 1970, Ser. No. 46,561

The portion of the term of this patent subsequent to Oct. 30, 1990, has been disclaimed.

Int. Cl.[2] A61K *7/06*

U.S. Cl. 424—70 **11 Claims**

1. A skin protective lotion or creme consisting essentially of emollient, humectant, surfactant and a protective agent in an amount effective to reduce the amount of skin irritation; said lotion or creme capable of reducing skin irritation compared to said lotion or creme without protective agent when applied to the skin prior to contact with a skin irritant; said protective agent selected from the group consisting of:

A. The polymerized product obtained from the polymerization of 2 to 4 molecules of a monomeric ethylenically unsaturated C_{12} to C_{26} fatty acid, said product containing 2 to 4 carboxyl groups; or in place of carboxyl groups derivative radicals selected from the group consisting of carboxyl salt; hydroxyl; unsubstituted amino; substituted amino wherein the substituents are aliphatic or aromatic hydrocarbon radicals of 1 to 12 carbon atoms, or said substituents taken together form a 3 to 6 membered carbocyclic or heterocyclic ring with the amino nitrogen; unsubstituted amido; substituted amido wherein the substituents are aliphatic or aromatic hydrocarbon radicals of 1 to 12 carbon atoms, or said substituents taken together form a 3 to 6 membered carbocyclic or heterocyclic ring with the amido nitrogen, quaternary ammonium wherein the nitrogen substituents are alkyl of 1 to 6 carbon atoms; lower alkyl ester; sulfate; sulfonate; phosphate; phosphonate; and derivative compounds containing further substituents in said alkyl, aliphatic or aromatic hydrocarbon radicals selected from the group consisting of carboxyl and the said derivative radicals;

B. esters and polyesters of cycloaliphatic or aromatic polycarboxylic acids containing at least one 5 to 7 carbon ring and hydroxy containing polyoxyalkylene ethers containing 2 to 30 oxyalkylene units in which the alkylene radical contains 2 to 4 carbon atoms;

C. esters and polyesters of the polymerized fatty acid product or the hydrogenated derivative thereof defined in A above and a hydroxy compound selected from the group consisting of

(a) polyoxyalkylene ethers containing 2 to 30 oxyalkylene units in which the alkylene radical contains 2 to 4 carbon atoms; and

(b) condensation products of alkylene oxides having 2 to 4 carbon atoms and polyamines having 2 to 4 amino groups and containing 2 to 8 carbon atoms in an aliphatic, cycloaliphatic or aromatic group.

4,075,319

LOW LEACHING ANTIFOULING ORGANOMETALLIC POLYVINYLS

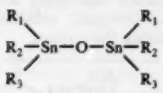
Edward J. Dyckman, Sunderland; Deborah M. Andersen, Annapolis, and Eugene C. Fischer, Arnold, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 24, 1976, Ser. No. 699,744

Int. Cl.[2] C08F *8/42;* **C08K** *5/57;* **B32B** *27/06*

U.S. Cl. 424—78 **12 Claims**

1. A composition of matter for preventing the growth of fouling organisms on marine structures said composition being characterized by a low leaching rate of the antifouling agent from the composition and comprising an organotin containing polymer, said polymer being the reaction product of a copolymer of methyl vinyl ether and maleic acid and an organotin oxide of the formula:



wherein R_1, R_2 and R_3 may be the same or different and are selected from the group consisting of propyl, butyl, phenyl and benzyl.

4,075,320

ATTRACTANT FOR ANTS

Fridolin Jacob Ritter, Waddinxveen, and Friedrich Stein, Schipluiden, both of Netherlands, assignors to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid, Handel en Verkeer, The Hague, Netherlands

Filed June 30, 1975, Ser. No. 592,085

Claims priority, application Netherlands, June 28, 1974, 7408757

Int. Cl.[2] A01N *17/14*

U.S. Cl. 424—84 **10 Claims**

1. An attractant composition for Pharaoh's ants which comprises biologically active amounts of (a) 2-(5'-n-hexenyl)-5-R-pyrrolidine wherein R is selected from the group consisting of n-pentyl, n-heptyl and n-nonyl, and (b) 5-methyl-3-n-butyloctahydroindolizine.

4,075,321

VACCINES, THE PROCESS FOR PREPARING THE SAME AND THE APPLICATIONS THEREOF

Edgar Hans Relyveld, Paris, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Division of Ser. No. 465,712, April 30, 1974, Pat. No. 3,983,229. This application July 12, 1976, Ser. No. 704,706

Claims priority, application France, May 4, 1973, 73.16131

Int. Cl.[2] A61K *39/02*

U.S. Cl. 424—92 **26 Claims**

1. An improvement in a process for preparing a bacterial vaccine by reacting whole bacteria with an inactivating agent and stopping the reaction as soon as said inactivation is achieved, wherein the improvement comprises the step of inactivating the whole bacteria with glutaraldehyde as the

inactivating agent at a concentration ranging from about 0.00131 M to 0.0526 M, whereby an inactivated product is obtained which is usable as a bacterial vaccine while remaining antigenic and retaining its immunizing power.

4,075,322

ENZYME COMPOSITION

Alexandr Pavlovich Bashkovich, prospekt M. Toreza, 40, korpus 7, kv. 21; Evgenia Semenovna Zimnukhova, ulitsa Pionerstroya, 18, kv. 206; Agnessa Vladimirovna Prokopovich, Bolsheokhtinsky prospekt, 79, kv. 9; Olga Grigorievna Polatovskaya, ulitsa Uchitelskaya, 19, korpus 1, kv. 29; Maria Ivanovna Pronina, ulitsa Sedova, 109, kv. 33; Valter Osvaldovich Kulbakh, Bukharestskaya ulitsa, 86, korpus 1, kv. 85; Khasya Ionovna Rivkina-Pevtsova, ulitsa Sadovaya, 92, kv. 5, and Grigory Efimovich Grinberg, prospekt Metallistov, 82, kv. 321, all of Leningrad, U.S.S.R.

Continuation of Ser. No. 418,847, Nov. 26, 1973, abandoned. This application July 7, 1975, Ser. No. 593,536

Int. Cl.[2] A61K *37/48*

U.S. Cl. 424—94 **6 Claims**

1. A composition having hydrolytic, proteolytic and thrombolytic properties consisting essentially of an effective amount of hygrolytin and a pharmaceutically acceptable carrier, said hygrolytin being the product of the process which comprises cultivating, under deep aerobic conditions, *Streptomyces hygroscopicus,* strain 1913 (All-Union Research Institute of Antibiotics, Moscow, Culture Collection, Deposit No. 997), using an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic substances, and separating hygrolytin formed during the culture.

4,075,323

COCCIDIOCIDAL COMBINATIONS

Larry R. McDougald, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 25, 1976, Ser. No. 670,486

Int. Cl.[2] A61K *35/66, 31/35*

U.S. Cl. 424—114 **2 Claims**

2. A coccidiocidal method for poultry which comprises orally administering to the poultry a coccidiocidally-effective combination of about 50 ppm of monensin and about 37 ppm of lasalocid, together with a poultry feedstuff or drinking water.

4,075,324

FUNGICIDAL COMPOSITIONS CONTAINING PHOSPHOROUS ACID AND DERIVATIVES THEREOF

André Thizy; Daniel Pillon; Jean-Claude Debourge, and Guy Lacroix, all of Lyon, France, assignors to Pepro, France

Filed Nov. 26, 1974, Ser. No. 527,380

Claims priority, application France, Nov. 26, 1973, 73 43081; Nov. 27, 1974, 74 33409

Int. Cl.[2] A01N *936, 11/00*

U.S. Cl. 424—128 **20 Claims**

1. A method of controlling fungus disease in plants comprising applying to said plants a fungicidally effective amount of at least one compound selected from the group consisting of phosphorous acid and mineral and ammonium salts thereof.

4,075,325

VETERINARY LICK PREPARATION

Gabriel Peter Kauzal, P.O. Box 1 Potts Point, Sydney, Australia (2011)

Filed Oct. 22, 1976, Ser. No. 735,046

Int. Cl.[2] A61K *33/34, 47/00;* **A23K** *1/02*

U.S. Cl. 424—140 **10 Claims**

1. A process for the production of a lick preparation for animals wherein molasses is compounded with at least one solidifying agent chosen from the group consisting of paraffin wax, hydrogenated animal fat, hydrogenated vegetable oil or a mixture of any of the foregoing, at an elevated temperature not exceeding 180° F and at an absolute pressure of at least 100 kilo Pascalls for a time sufficient to permit thickening thereof without solidifying and then allowing the preparation to cool and solidify.

4,075,326

FUNGICIDAL/ALGICIDAL COMPOSITION FOR NON-MEDICAL USES

Hiroshi Kuyama, Urawa, and Nobuyuki Higosaki, Tanashi, both of Japan, assignors to Rohm and Haas Company, Philadelphia, Pa.

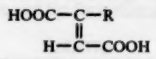
Division of Ser. No. 534,519, Dec. 19, 1974, Pat. No. 3,961,933. This application Mar. 19, 1976, Ser. No. 667,813

Claims priority, application Japan, Dec. 22, 1973, 49-3172

Int. Cl.[2] A01N *11/02, 11/04*

U.S. Cl. 424—141 **4 Claims**

1. A fungicidal composition which comprises a fungicide which consists essentially of a combined effective amount of at least one compound selected from Group A and at least one compound selected from Group B wherein Group A is a copper salt of an unsaturated dibasic acid of the formula:



wherein R is a hydrogen atom or a lower alkyl group and Group B is an inorganic copper salt selected from the group consisting of copper oxychloride, basic copper sulfate, basic copper carbonate, copper silicate, cuprous oxide, basic copper phosphate and copper hydroxide, the ratio of A to B being from 1:9 to 9:1.

4,075,327

METHOD FOR THE TREATMENT OF TREES SUBJECT TO DUTCH ELM DISEASE

Erik Jorgensen, Ottawa; Dibyendu N. Roy, Willowdale, and Edward S. Kondo, Sault Ste. Marie, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Division of Ser. No. 347,902, April 4, 1973, abandoned. This application May 17, 1974, Ser. No. 470,950

Claims priority, application Canada, May 7, 1972, 142406

Int. Cl.[2] A01N *9/22*

U.S. Cl. 424—273 R **5 Claims**

1. A method of systemic fungicide treatment of trees subject to Dutch elm disease comprising severing one or more roots of the tree below ground level and applying an aqueous solution of a water-soluble derivative of methyl-benzimidazole carbamate fungicide material, said solution having a concentration of 50 to 2000 parts of fungicide material per million parts of the aqueous solution, to the severed end of the root under a positive pressure in the range 5 psi. and 25 psi. and for a treatment time between one hour and 48 hours, wherein the fungicide material is methyl-2-benzimidazole carbamate chloride.

4,075,328

NAPHTHACENE DERIVATIVES

Jean Bernard Ducep, Paris; Daniel Farge, Thiais; Gerard Ponsinet, Sceaux, and Daniel Reisdorf, Thiais, all of France, assignors to Rhone-Poulenc Industries, Paris, France

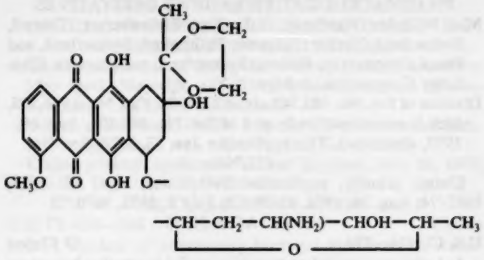
Filed June 14, 1976, Ser. No. 695,444

Claims priority, application France, June 16, 1975, 75 18746

Int. Cl.[2] A61K *31/71;* **C07H** *15/24*

U.S. Cl. 424—180 **4 Claims**

1. The naphthacene derivative of the formula:



and non-toxic acid addition salts thereof.

4. A pharmaceutical composition which comprises as active ingredient a significant amount of the naphthacene derivative or non-toxic acid addition salt thereof as claimed in claim 1 in association with a compatible pharmaceutically acceptable carrier.

4,075,329

PROCESS FOR PROTECTING ORGANIC MATERIALS USING A BACTERIOSTATIC COFFEE EXTRACT

Pierre Hirsbrunner, Corseaux; Theodor Beyeler, Vevey, and David Shepherd, Morges, all of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Continuation of Ser. No. 556,290, March 7, 1975, abandoned. This application Apr. 22, 1976, Ser. No. 679,321

Claims priority, application Switzerland, Apr. 8, 1974, 4907/74

Int. Cl.[2] A01N *9/08*

U.S. Cl. 424—195 8 Claims

1. A process of obtaining a bacteriostatic agent from unroasted coffee beans comprising the steps of

contacting a mass of unroasted coffee beans with an organic solvent phase and a basic aqueous phase,

thereafter decanting and separating the basic aqueous phase,

acidifying the separated basic phase,

thereafter contacting the acidified aqueous phase with an organic solvent phase, and

then separating the solvent phase containing the bacteriostatic agent.

4,075,330

O,S-DIALKYL-O-[1-ALKYL-3,4-TRIMETHYLENE-PYRAZOL(5)YL]-THIONOTHIOLPHOSPHORIC ACID ESTER

Hellmut Hoffmann, Wuppertal, and Ingeborg Hammann, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

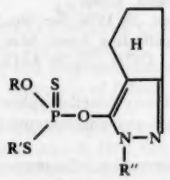
Filed Feb. 10, 1977, Ser. No. 767,585

Claims priority, application Germany, Feb. 26, 1976, 2607658

Int. Cl.[2] C07F *9/65;* A01N *9/36*

U.S. Cl. 424—200 10 Claims

1. An O,S-dialkyl-O-[1-alkyl-3,4-trimethylene-pyrazol(5)yl]-thionothiolphosphoric acid ester of the formula



in which

R and R' each independently is alkyl with 1 to 6 carbon atoms, and

R" is alkyl with 1 to 4 carbon atoms or cyanoalkyl with 1 to 4 carbon atoms in the alkyl radical.

8. An arthropodicidal composition containing as active ingredient an arthropodicidally effective amount of an ester according to claim 1 in admixture with a diluent.

9. A method of combating arthropods which comprises applying to the arthropods or to a habitat thereof, an arthropodicidally effective amount of an ester according to claim 1.

4,075,331

MONOESTERS OF ROSAMICIN FOR ELICITING AN ANTIBACTERIAL RESPONSE

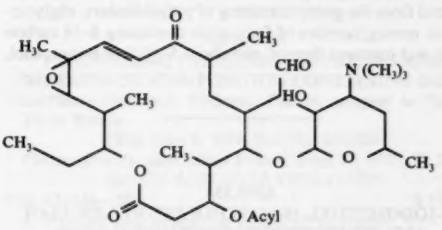
Hans Reimann, Wayne, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 627,322, Oct. 30, 1975, Pat. No. 4,017,516, which is a continuation-in-part of Ser. No. 303,903, Nov. 15, 1972, abandoned. This application Jan. 13, 1977, Ser. No. 759,317

Int. Cl.[2] A61K *31/665, 31/335*

U.S. Cl. 424—203 6 Claims

1. A method of eliciting an antibacterial response in mammals which comprises administering to a mammal having a bacterial infection a therapeutically effective quantity of a compound of the formula:



or the pharmaceutically acceptable acid addition salts thereof wherein the acyl function is a

moiety derived from a hydrocarbon carboxylic acid having from 2 to 18 carbon atoms consisting of straight and branched chain alkyl, cycloalkyl, aryl, aralkyl or dibasic acids.

4,075,332

PESTICIDAL O,S'-DIALKYL S-HYDROCARBYLTHIOALKYL DITHIOPHOSPHATES AND OXIDIZED DERIVATIVES THEREOF

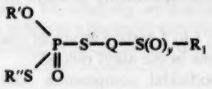
Alexis A. Oswald, Mountainside, and Paul L. Valint, Jr., Woodbridge, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 505,109, July 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 210,229, Dec. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 173,267, Aug. 19, 1971, abandoned, which is a continuation of Ser. No. 821,117, May 1, 1969, abandoned. This application Apr. 16, 1976, Ser. No. 677,719

Int. Cl.[2] A01N *9/36*

U.S. Cl. 424—216 28 Claims

1. A pesticidal composition for combatting insects, nematodes, mites, and fungi comprising as an active ingredient, a pesticidally effective amount of a compound of the formula:



where R′ is methyl or ethyl; R″ is primary or secondary C_3 to C_4 alkyl; R_1 is C_1 to C_3 alkyl, phenyl or chlorophenyl; Q is C_1 to C_4 alkylene; and *y* is 0 to 2; provided that when Q is methylene, *y* is 0; and further comprising a carrier.

4,075,333

STABLE INJECTABLE VITAMIN COMPOSITIONS

René Josse, Riedisheim, France, assignor to Hoffmann-La Roche, Inc., Nutley, N.J.

Filed Aug. 20, 1975, Ser. No. 606,383

Claims priority, application Switzerland, Feb. 14, 1975, 1897/75

Int. Cl.² A01N *9/28*; A61K *31/355, 31/595, 31/07*

U.S. Cl. 424—237 **9 Claims**

1. A stable injectable vitamin composition comprising on a weight to volume basis about 20–55% of vitamin A propionate, 0 to about 1% vitamin D component, 0 to about 8% vitamin E component, about 10–30% of a non-ionic emulsifier containing polyoxyethylene groups, about 5–45% of a solubilizing agent selected from the group consisting of polyoldiesters, triglycerides or monoglycerides of fatty acids containing 6–14 carbon atoms and mixtures thereof, and about 5–15% of isopropanol.

4,075,334

6β-IODOMETHYL-19-NORCHOLEST-5(10)-EN-3β-OL AND COMPOSITIONS CONTAINING SAME

Masaharu Kojima, Fukuoka; Hiroshi Ogawa, Chiba; Minoru Maeda, Fukuoka; Kazuo Nitta, and Takayuki Ito, both of Chiba, all of Japan, assignors to Mallinckrodt, Inc., St. Louis, Mo.

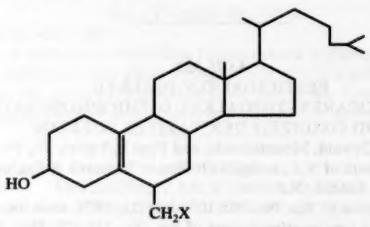
Filed Mar. 27, 1975, Ser. No. 562,666

Claims priority, application Japan, May 20, 1974, 49-56822

Int. Cl.² C07J *9/00*; A61K *31/56*

U.S. Cl. 424—238 **10 Claims**

1. A compound represented by the following formula



I

wherein X is iodine or radioactive iodine, said compound being substantially free of 19-iodocholest-5-en-3β-ol and radioiodinated-19-iodocholest-5-en-3β-ol.

5. In a method for photoscanning the adrenal gland wherein a radioactive labelled compound is injected into a patient and thereafter a photoscan made of the patient's adrenal gland the improvement comprising using as the radioactive compound a compound of claim 1 wherein X is radioactive iodine.

4,075,335

PHARMACEUTICAL PIPERIDINE DERIVATIVES

Max Wilhelm, Watchung, N.J.; Kurt Eichenberger, Therwil, Switzerland; Herbert Schroter, Fullinsdorf, Switzerland, and Franz Ostermayer, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

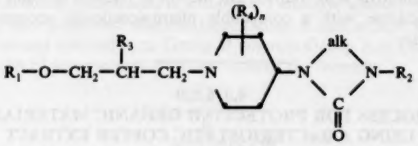
Division of Ser. No. 483,742, June 27, 1974, Pat. No. 3,956,335, which is a continuation-in-part of Ser. No. 389,106, Aug. 16, 1973, abandoned. This application Jan. 28, 1976, Ser. No. 652,966

Claims priority, application Switzerland, Apr. 30, 1974, 5907/74; Aug. 24, 1972, 12539/72; July 3, 1973, 9670/73

Int. Cl.² A61K *31/33*

U.S. Cl. 424—244 **13 Claims**

1. A pharmaceutical composition useful in treating hypertension and tachycardia which comprises an anti-hypertensively and anti-tachycardially effective amount of a piperidine compound having the formula



wherein R_1 is phenyl, naphthyl, 5,6,7,8-tetrahydro-1-naphthyl or 5,6,7,8-tetrahydro-2-naphthyl radical which is unsubstituted, monosubstituted or disubstituted by lower alkyl, lower alkoxy, lower alkenyl, lower alkenyloxy, halogen, halogeno-lower alkyl, carbamoyl, lower alkyl-substituted carbamoyl, lower alkoxycarbonylamino-lower alkyl, lower alkoxy-lower alkoxy, lower alkanoylaminoethenyl, lower alkylthio-lower alkoxy, hydroxyl, lower alkanoyl, lower alkoxy-lower alkyl, lower alkynyl, lower alkylthio-lower alkyl, hydroxy-lower alkyl, lower alkanoyloxy, lower alkylthio, lower alkanoyl amino, cyano, amino, nitro, ureido, lower alkylated ureido, phenyl-lower alkoxy, or lower alkynyloxy, R_2 is hydrogen, lower alkyl, lower alkenyl, α-phenyl-lower alkyl or lower alkanoyl, R_3 is a free hydroxyl group, a lower alkanoyloxy group or a lower alkoxy group, R_4 is hydrogen or lower alkyl, *n* is an integer from 0 to 4, and alk is an optionally mono-lower alkylated ethylene radical or a salt thereof, together with a therapeutically useful carrier.

4,075,336

THIAZINES AND METHOD

Yasunori Kondo, Tokyo, Japan, assignor to Kanto Ishiseiyaku Co., Ltd., Tokorozawa, Japan

Filed Nov. 29, 1976, Ser. No. 745,762

Claims priority, application Japan, Mar. 11, 1976, 51-26353

Int. Cl.² C07D *279/08*; A61K *31/54*

U.S. Cl. 424—246 **4 Claims**

1. 4-oxo-2-(3-hydroxy-4-methoxyphenyl)-2, 3-dihydro-5, 6-benzo-1, 3 -thiazine and pharmaceutically acceptable salts thereof.

2. A method for decreasing inflammation in mammals which comprises administering an anti-inflammatory effect amount of the compound of claim 1.

4,075,337

METHODS OF COMBATTING BACTERIAL INFECTIONS IN WARM-BLOODED ANIMAL WITH CEPHALSPORIN R-SULFOXIDE

Arthur Friedrich Marx, Delft; Jan Verwey, Leiden, and Peter Max Smid, Bleiswijk, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Division of Ser. No. 377,934, July 10, 1973, abandoned. This application Nov. 18, 1975, Ser. No. 633,006

Claims priority, application United Kingdom, July 18, 1972, 33596/72; Oct. 23, 1972, 48720/72

Int. Cl.[2] A61K *31/54, 31/43*

U.S. Cl. 424—246 2 Claims

1. A method of combatting bacterial infections in warm-blooded animals comprising administering to said warm-blooded animals a bactericidally effective amount of a compound selected from the group consisting of 7-phenylacetamido-Δ^3-desacetoxycephalosporanic acid R-sulfoxide and non-toxic, pharmaceutically acceptable salt thereof.

4,075,338

SUBSTITUTED ACETAMIDOCEPHALOSPORINS

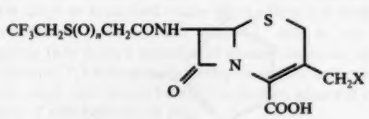
Robert M. DeMarinis, King of Prussia, Pa., assignor to Smith-Kline Corporation, Philadelphia, Pa.

Division of Ser. No. 644,475, Dec. 29, 1975, Pat. No. 4,013,765, which is a division of Ser. No. 428,536, Dec. 26, 1973, Pat. No. 3,957,770. This application Dec. 3, 1976, Ser. No. 747,131

Int. Cl.[2] A61K *31/545*

U.S. Cl. 424—246 8 Claims

5. A method of treating bacterial infections comprising administering by injection to a warm-blooded animal an effective but non-toxic dose of 250–1000 mg of a compound of the formula



where

n is 0, 1, or 2; and

X is hydrogen or acetoxy;

or a non-toxic pharmaceutically acceptable salt thereof.

4,075,339

BIOLOGICALLY ACTIVE COMPOUNDS

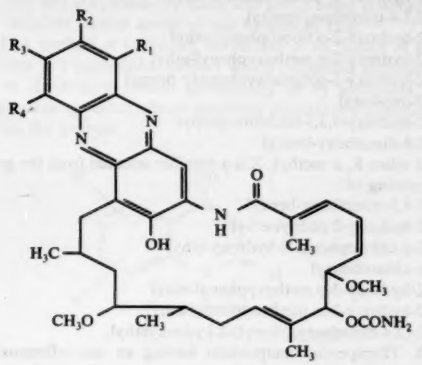
Kenneth L. Rinehart, Jr., Urbana, Ill.; Moses W. McMillan, Indianapolis, Ind., and Wojciech Sobiczewski, Warsaw, Poland, assignors to University of Illinois Foundation, Urbana, Ill.

Division of Ser. No. 458,139, April 5, 1974, Pat. No. 3,987,035. This application Aug. 2, 1976, Ser. No. 710,575

Int. Cl.[2] C07D *487/04;* A61K *31/395*

U.S. Cl. 424—250 3 Claims

1. A compound of the formula



wherein R_1, R_2, R_3, and R_4 are the same or different and selected from hydrogen, hydroxy, halo, amino, and C_1 to C_{20} saturated alkyl, alkoxy wherein the alkyl portion is C_1 to C_{20} saturated alkyl, alkoxycarbonyl wherein the alkyl portion is C_1 to C_{20} saturated alkyl, amide or N-alkyl substituted amide wherein the alkyl portion is C_1 to C_{20} saturated alkyl.

3. A therapeutic method for treatment of a host to a bacterial or viral disease which comprises administering a therapeutically effective amount of a compound according to claim 1.

4,075,340

THIENO [2,3-c] PYRIDINE DERIVATIVES AND THERAPEUTIC COMPOSITION CONTAINING SAME

Jean-Pierre Maffrand, Toulouse, France, assignor to Parcor, Paris, France

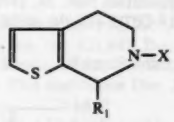
Filed June 2, 1976, Ser. No. 692,186

Claims priority, application France, June 27, 1975, 75 20241

Int. Cl.[2] A61K *31/54;* C07D *417/04*

U.S. Cl. 424—256 5 Claims

1. A compound having the following structure:



in which R_1 is a member selected from the group consisting of hydrogen and methyl, with a proviso that when R_1 is hydrogen, X is a member selected from the group consisting of

n-dodecyl,
o-methoxycarbonylbenzyl
o-carboxybenzyl
2-(5-chloro-thienyl)-methyl
2-acetoxy-2-p-chlorophenyl-ethyl
2-hydroxy-propyl
2-acetoxy-2-m.methoxyphenyl-ethyl
o-nitrobenzyl
p-nitrobenzyl
o-cyanobenzyl
2-chloro-benzyl
3,4,5-trimethoxy-benzyl
β-phenethyl
m.methoxybenzyl
p.chlorobenzyl
m.chlorobenzyl
2-hydroxy-2-phenyl-ethyl
p.methylbenzyl
3,4-dimethoxy-benzyl
o.fluorobenzyl

2-hydroxy-2- p.chlorophenyl-ethyl
2,3,4-trimethoxy-benzyl
2-hydroxy-2-p.fluorophenyl-ethyl
2-hydroxy-2-p.methoxyphenyl-ethyl
2-hydroxy-3-p.methoxyphenoxy-propyl
3-oxo-butyl
2-hydroxy-3,3,3-trichloro-propyl
3,4-dimethoxy-benzyl

and when R_1 is methyl, X is a member selected from the group consisting of

3,4,5-trimethoxy-benzyl
2-hydroxy-2-phenyl-ethyl
2-p.chlorophenyl-2-hydroxy-ethyl
o-chlorobenzyl
2-hydroxy-2-p.methoxyphenyl-ethyl
2-hydroxy-2-m.methoxyphenyl-ethyl
2-(2,4-dimethoxy-phenyl)-2-hydroxyethyl.

3. Therapeutic composition having an anti-inflammatory activity, comprising, as active ingredient, a compound according to claim 1 together with a pharmaceutically acceptable carrier, in unit dosage form, each unit dose containing 0.010–0.300 g active ingredient.

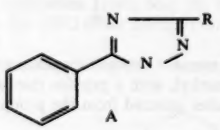
4,075,341

2-SUBSTITUTED PHENYL-5-TRIAZOLS [5,1-A] ISOQUINOLINE COMPOUNDS

Amedeo Omodei-Salé, Voghera (Pavia); Pietro Consonni, and Leonard Lerner, both of Milan, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

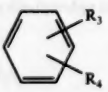
Continuation-in-part of Ser. No. 473,045, May 24, 1974, abandoned. This application Nov. 28, 1975, Ser. No. 636,330
Int. Cl.[2] C07D *471/04;* A61K *31/53*
U.S. Cl. 424—258 **14 Claims**

1. A compound of the formula



A

wherein A represents the group $—CH_2—CH_2—$ or —CH=CH—; and
wherein R is substituted phenyl of the formula



wherein one of the substituents R_3 and R_4 is located in the 3- or 4-position of the phenyl ring, and represents a lower alkoxy, lower alkenyloxy, lower alkynyloxy, fluoro, chloro, bromo, trifluoromethyl, hydroxy, cyclopropyloxy, cyclobutyloxy, cyclopentyloxy, benzyloxy, nitro or dimethylamino group and the other represents hydrogen, methoxy, fluoro, chloro or bromo; or R_3 and R_4 taken together represent a methylenedioxy group.

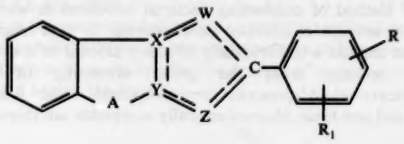
4,075,342

ANTIREPRODUCTIVE IMIDAZO[2,1-a]ISOQUINOLINE COMPOUNDS

Amedeo Omodei Salé, Pavia; Emilio Toia, Milan; Giulio Galliani, Milan, and Leonard J. Lerner, Milan, all of Italy, assignors to Gruppo Lepetit, S.p.A., Milan, Italy

Filed Nov. 6, 1975, Ser. No. 629,339
Claims priority, application United Kingdom, Nov. 23, 1974, 50855/74
Int. Cl.[2] C07D *471/04;* A61K *31/47*
U.S. Cl. 424—258 **6 Claims**

1. A tricyclic compound of the formula



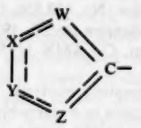
I

wherein:

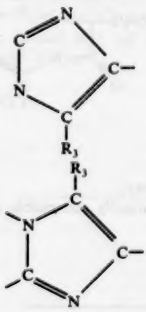
A represents one member of the group —CH=CH—; and $—CH_2—CH_2—$;

R represents one member of the group: hydrogen, lower alkyl, lower alkoxy, lower alkenyloxy, lower alkylnyloxy, cyclopropyloxy, cyclobutyloxy, cyclopentyloxy, cyclohexyloxy, hydroxy, benzyloxy, fluoro, chloro, bromo, iodo, trifluoromethyl and nitro; R_1 represents hydrogen, lower alkoxy, fluoro, chloro or bromo; or R and R_1 taken together represent a methylenedioxy group;

the sequence



represents one of the following moieties:

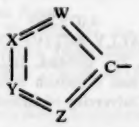


c)

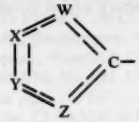
d)

R_3 represents hydrogen or lower alkyl;

when the sequence



represents the moiety c) wherein R_3 is hydrogen and simultaneously both R and R_1 represent hydrogen, the symbol A may not represent the group —CH=CH—; and when the sequence



represents the moiety (d) wherein R_3 is hydrogen and simultaneously both R and R_1 represent hydrogen, the symbol A may not represent —CH=CH— or —CH_2—CH_2—; or a salt thereof with a non-toxic pharmaceutically-acceptable acid.

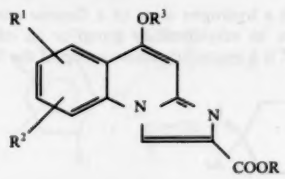
4,075,343

ANTI-ALLERGENIC 5-ALKOXYIMIDAZO[1,2-a]QUINOLINE-2-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF

Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Sept. 13, 1976, Ser. No. 722,429
Int. Cl.² A61K *31/47*; C07D *471/04*
U.S. Cl. 424—258 **23 Claims**

1. A compound of the formula



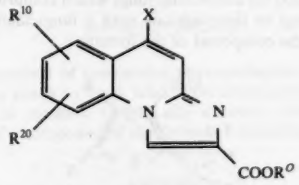
wherein R is hydrogen or alkyl having from one to five carbon atoms;

R^1 and R^2 are each selected from the group consisting of hydrogen, alkyl having from one to five carbon atoms, alkoxy having from one to five carbon atoms, fluoro, chloro, bromo, methylthio and methylsulfinyl, with the proviso that when both of said R^1 and R^2 are branched chain alkyl or branched chain alkoxy they are located on non-adjacent position; and when R^1 and R^2 are taken together they form a member of group consisting of tetramethylene, 1,3-butadienyl, methylenedioxy and ethylenedioxy, each said group being attached to adjacent carbon atoms of said benzenoid ring;

R^3 is alkyl having from one to five carbon atoms;

and the pharmaceutically acceptable cationic salts of those compounds wherein R is hydrogen.

11. A compound of the formula

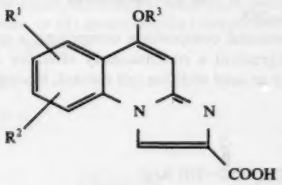


wherein X is chloro or bromo;

R^0 is alkyl having from one to five carbon atoms;

R^{10} and R^{20} are each selected from the group consisting of hydrogen, alkyl having from one to five carbon atoms, alkoxy having from one to five carbon atoms and fluoro, with the proviso that when both of said R^{10} and R^{20} are branched chain alkyl or branched chain alkoxy they are located on non-adjacent positions; and when R^{10} and R^{20} are taken together they form a member of the group consisting of tetramethylene, 1,3-butadienyl, methylenedioxy and ethylenedioxy, each said group being attached to adjacent carbon atoms of said benzenoid ring.

12. A method of inhibiting the release of mediators of anaphylaxis in a mammalian subject which comprises administering to the subject orally, parenterally or by inhalation, an anaphylaxis mediator release inhibiting amount of a compound having the formula



wherein R^1 and R^2 are each selected from the group consisting of hydrogen, alkyl having from one to five carbon atoms, alkoxy having from one to five carbon atoms, fluoro, chloro, bromo, methylthio and methylsulfinyl, with the proviso that when both of said R^1 and R^2 are branched chain alkyl or branched chain alkoxy they are located on non-adjacent positions; and when R^1 and R^2 are taken together they form a member of the group consisting of tetramethylene, 1,3-butadienyl, methylenedioxy and ethylenedioxy, each said group being attached to adjacent carbon atoms of said benzenoid ring;

R^3 is alkyl having from one to five carbon atoms;

and the pharmaceutically acceptable cationic salts thereof.

19. A pharmaceutical composition active as an antiallergy agent comprising a pharmaceutically acceptable carrier and a compound of claim **1** wherein R is hydrogen and the pharmaceutically acceptable cationic salts thereof.

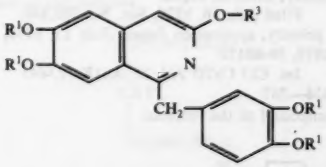
4,075,344

3-ALKOXYISOQUINOLINES FOR HYPOTENSIVE AND VASODILATING EFFECTS

William E. Kreighbaum, and William T. Comer, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 612,884, Sept. 12, 1975, Pat. No. 4,015,006, which is a division of Ser. No. 423,841, Dec. 11, 1973, Pat. No. 3,910,927, which is a division of Ser. No. 184,197, Sept. 27, 1971, Pat. No. 3,798,225. This application Dec. 22, 1976, Ser. No. 753,123
Int. Cl.² A61K *31/47*
U.S. Cl. 424—258 **3 Claims**

1. A process for eliciting a hypotensive and vasodilating effect in a mammal in need thereof which comprises systemic administration to said mammal a non-toxic effective dose of from about 0.05 to 20 mg./kg. of body weight of said mammal of a compound selected from the group consisting of those having the formula



wherein

R^1 is lower alkyl having up to 4 carbon atoms;

R^3 is lower alkyl having up to 4 carbon atoms, alkenyl having from 3 to 6 carbon atoms, cycloalkyl having from 3 to 5 carbon atoms, benzyl;

and a pharmaceutically acceptable acid addition salt thereof.

4,075,345
3-PYRIDYLMETHYL ARYL UREA RODENTICIDES COMPOSITIONS

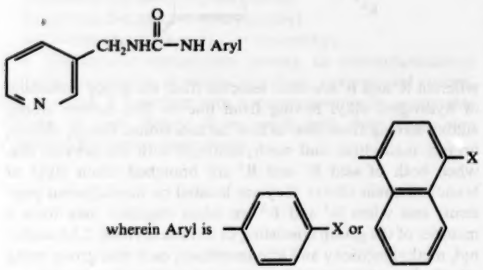
Edward E. Kilbourn; David L. Peardon, both of Chalfont, and J. Edgar Ware, Quakertown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 342,334, March 19, 1973, abandoned. This application Apr. 11, 1974, Ser. No. 460,263

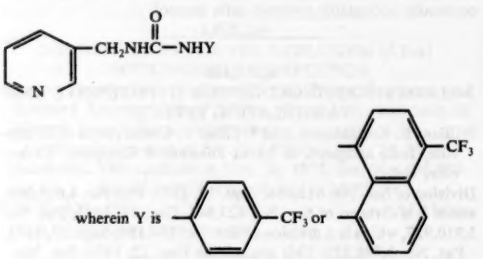
Int. Cl.[2] A01N *9/22*

U.S. Cl. 424—263 **12 Claims**

1. A rodenticidal composition comprising a carrier and as the active ingredient a rodenticidally effective amount of a compound, or an acid addition salt thereof, having the formula



wherein X is selected from the group consisting of $—NO_2$, —CH, $—C(O)CH_2CH_2CH_3$, —SCN, $—SCH_3$, $—SC_2H_5$, $—SC_4H_9$-n, $—SC_4H_9$-sec, $—SC_6H_{13}$-n, $—SO_2C_6H_5$, and $—SO_2N(C_2H_5)_2$, or a compound having the formula



4,075,346
CNS DEPRESSANT γ-(SECONDARY AMINO)-ORTHO-NITRO-BUTYROPHENONES

Kikuo Sasajima, Toyonaka; Keiichi Ono, Nishinomiya; Yasuo Motoike, Minoo; Shigeho Inaba, Takarazuka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

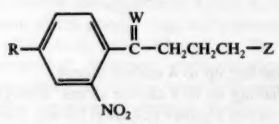
Filed July 16, 1976, Ser. No. 705,840

Claims priority, application Japan, July 17, 1975, 50-87962; July 18, 1975, 50-88473

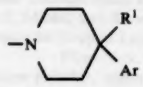
Int. Cl.[2] C07D *211/28;* A61K *31/445*

U.S. Cl. 424—267 **8 Claims**

1. A compound of the formula:

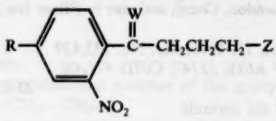


wherein R is a hydrogen atom or a fluorine atom, W is an oxygen atom, an ethylenediozy group or an ethylenedithio group and Z is a secondary amino group of the formula:

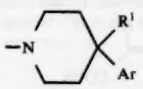


wherein Ar is an unsubstituted phenyl group or a phenyl group substituted with one or two substituents selected from the group consisting of halogen, methyl, methoxy and trifluoromethyl and R_1 is a hydrogen atom or a hydroxyl group, or a pharmaceutically acceptable acid addition salt thereof.

5. A central nervous system depressant composition which comprises as the active ingredient at least one of the γ-(secondary amino)-orthonitrobutyrophenones of the formula:



wherein R is a hydrogen atom or a fluorine atom, W is an oxygen atom, an ethylenedioxy group or an ethylenedithio group, and Z is a secondary amino group of the formula:



wherein Ar is an unsubstituted phenyl group or a phenyl group substituted with one or two substituents selected from the group consisting of halogen, methyl, methoxy and trifluoromethyl and R_1 is a hydrogen atom or a hydroxyl group, or a pharmaceutically acceptable acid addition salt thereof, and at least one pharmaceutically acceptable carrier or diluent.

4,075,347
FUNGICIDAL 5-DIALKYLAMINO-4-NITROSULFONAMIDOTHIOPHENES

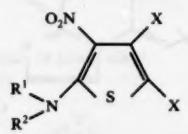
Laroy H. Edwards, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 578,851, May 9, 1975, Pat. No. 3,996,243. This application Oct. 12, 1976, Ser. No. 731,246

Int. Cl.[2] A01N *9/12*

U.S. Cl. 424—275 **14 Claims**

1. A method for controlling fungi which comprises contacting said fungi or their habitats with a fungicidally effective amount of the compound of the formula



wherein R^1 is alkyl of 1 to 6 carbon atoms; R^2 is alkyl of 1 to 6 carbon atoms; one X is hydrogen, fluoro, chloro or bromo and the other X is $—SO_2N(R^3)(R^4)$ wherein R^3 is hydrogen, alkyl of 1 to 6 carbon atoms, phenyl or phenyl substituted with 1 to 2 of the same or different substituents selected from trifluoromethyl, trichloromethyl, fluoro, chloro, bromo, nitro or alkyl of 1 to 3 carbon atoms and R^4 is haloalkylthio of 1 to 3 carbon atoms and 1 to 7 of the same or different halogens selected from fluoro, chloro or bromo.

4,075,348

ALKYL ALLOPHANATES, METHOD FOR PREPARATION AND FUNGICIDAL USE OF THE SAME

Paul William Knapp, Jr., Bordentown, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 689,030, May 24, 1976, Pat. No. 4,045,470.
This application Apr. 22, 1977, Ser. No. 790,114
Int. Cl.[2] A01N 9/12
U.S. Cl. 424—300 1 Claim

1. A method for the control of fungi comprising: contacting fungi with a fungicidally effective amount of allophanic acid-, 3-thio-4-{o-[(2,2,2-trichloroethylidene)amino]phenyl}-, methyl ester.

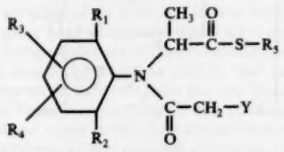
4,075,349

MICROBICIDAL COMPOSITIONS

Adolf Hubele, Magden; Walter Kunz, Oberwil, both of Switzerland, and Wolfgang Eckhardt, Lorrach, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sept. 24, 1976, Ser. No. 726,321
Claims priority, application Switzerland, Sept. 30, 1975, 12649/75
Int. Cl.[2] A01N 9/12; C07C 153/09
U.S. Cl. 424—301 22 Claims

1. A compound of the formula I



(I)

wherein

R_1 represents a C_1–C_4-alkyl group, a C_1–C_4-alkoxy group or a halogen atom,

R_2 represents a C_1–C_3-alkyl group, a C_1–C_4-alkoxy group or a halogen atom,

R_3 represents a hydrogen atom, a C_1–C_3-alkyl group or a halogen atom,

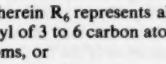
R_4 represents a hydrogen atom or a methyl group, with the proviso that the total number of carbon atoms contained by the substituents R_1, R_2, R_3 and R_4 in the phenyl ring does not exceed 8,

R_5 represents a methyl or ethyl group, while

Y represents one of the following groups:

a. —O—R_6

b. —S—R_6, wherein R_6 represents alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, or alkinyl of 3 to 6 carbon atoms, or



c) $-S-\overset{\overset{S}{\|}}{C}-N(CH_3)_2$.

22. A method of combatting phytopathogenic fungi or of preventing attack by fungi, which comprises applying to plants or parts of plants a fungicidally effective, non-phytotoxic amount of a compound of the formula I according to claim 1.

4,075,350

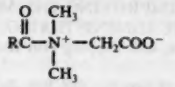
ANTIMICROBIAL COMPOSITIONS EMPLOYING CERTAIN BETAINES AND CERTAIN AMINE OXIDES

Edwin B. Michaels, East Norwalk, Conn. 06855

Filed Dec. 18, 1975, Ser. No. 641,728
Int. Cl.[2] A61K 31/13
U.S. Cl. 424—316 7 Claims

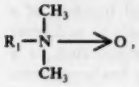
1. A broad spectrum antimicrobial composition having low toxicity which consists essentially of:

(a) 0.1 to 40 parts, by weight, of a higher acyl-N-betaine said betaine having the structure:

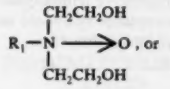


where R is a higher alkyl of from 10 to 18 carbon atoms,

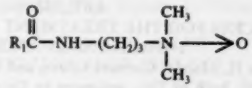
(b) 0.1 to 40 parts, by weight, of (1) a higher alkyl-N,N-dimethylamine oxide, (2) a higher alkyl-N,N-dihydroxyethylamine oxide, or (3) an acylamido t-amine oxide having the respective structure:



(1)



(2)



(3)

where R_1 is a higher alkyl of from 10 to 18 carbon atoms, or mixtures of the same, and

(c) a protonating agent, sufficient to adjust the pH of said composition from 4 to 5.5.

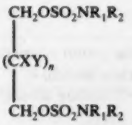
4,075,351

INHIBITION OF MALE FERTILITY WITH ALIPHATIC SULFAMATES

Allen Frederick Hirsch, Somerville, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 537,613, Dec. 30, 1974, Pat. No. 3,997,585.
This application Aug. 3, 1976, Ser. No. 711,188
Int. Cl.[2] A61K 31/255, 31/18, 31/455
U.S. Cl. 424—303 5 Claims

1. A method of inhibiting fertility in male animals comprising administering to a male animal an effective amount of a compound of the formula



wherein n is an integer from 0 to 8 and X and Y are hydrogen, provided that when n is 1, X and Y are hydrogen, lower alkyl having 1–3 carbon atoms, phenyl, benzyl or phenethyl, R_1 and R_2 are hydrogen, alkyl having 1–7 carbon atoms, phenyl, benzyl, phenethyl or cycloalkyl having 5–6 carbon atoms, and R_1 and R_2 together with the nitrogen are piperidyl.

4,075,352

METHOD OF IMPROVING THE MYOCARDIAL FUNCTION BY THE ADMINISTRATION OF CARNITINE

Stephen L. De Felice, 430 Topping Hill Road, Westfield, N.J. 07090

Continuation-in-part of Ser. No. 485,301, July 2, 1974, Pat. No. 3,968,241, which is a continuation-in-part of Ser. No. 303,772, Nov. 6, 1972, Pat. No. 3,830,931. This application Apr. 28, 1976, Ser. No. 681,063

The portion of the term of this patent subsequent to Aug. 20, 1991, has been disclaimed.

Int. Cl.[2] A61K *31/195*

U.S. Cl. 424—319 5 Claims

1. A method of improving the myocardial function of a human or animal heart when the oxygen supply to said heart has been diminished which comprises administering to a human or animal whose heart's oxygen supply has been diminished, an amount of β-hydroxy-γ-trimethylaminobutyric acid or a pharmaceutically acceptable non-toxic salt thereof, sufficient to improve the myocardial function.

4,075,353

PROCESS FOR THE TREATMENT OF ACARID SKIN INFECTIONS IN ANIMALS

Stephen H. Mandy, Coconut Grove, and William D. Thompson, Miami, both of Fla., assignors to Dermatologics for Veterinary Medicine, Inc., Miami, Fla.

Filed June 9, 1976, Ser. No. 694,356

Int. Cl.[2] A61K *31/075*

U.S. Cl. 424—338 31 Claims

1. A process for treating a skin infection, caused by an acarid-parasite, in an animal comprising topically applying a therapeutically effective parasiticidal amount of benzoyl peroxide to said animal.

4,075,354

ETHYNYLBENZENE COMPOUNDS AND DERIVATIVES THEREOF FOR TREATING PAIN FEVER AND INFLAMMATION

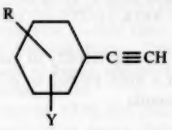
Julius Diamond, Morris Plains, N.J., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 493,590, Aug. 1, 1974, Pat. No. 3,898,292, which is a division of Ser. No. 268,419, July 3, 1972, Pat. No. 3,852,364. This application June 10, 1975, Ser. No. 585,631

Int. Cl.[2] A61U *31/015*

U.S. Cl. 424—356 4 Claims

1. A pharmaceutical composition in dosage unit form adapted for administration to obtain relief from inflammation, pain and fever, comprising, per dosage unit, an effective non-toxic amount of at least one compound of the formula:



wherein

R is selected from the group consisting of:
alkyl of 1 to 7 carbon atoms,
cycloalkyl of 5 to 7 carbon atoms,
1–7 carbon atoms alkyl
substituted cycloalkyl of 5 to 7 carbon atoms,
cycloalkenyl of 5 to 7 carbon atoms,
phenyl and
1 to 7 carbon atoms alkyl
substituted phenyl, and

Y is lower alkyl of 1 to 7 carbon atoms, and a suitable pharmaceutical carrier.

4,075,355

METHOD AND APPARATUS FOR REGULATING THE FAT CONTENT OF MILK

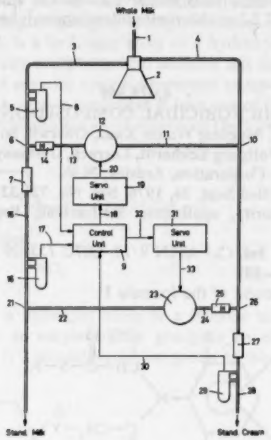
Tibor Pató, Bern, Switzerland, assignor to Gebruder Ott A.G., Worb, Switzerland

Filed June 25, 1976, Ser. No. 699,859

Claims priority, application Switzerland, July 4, 1975, 8782/75; May 26, 1976, 6652/76

Int. Cl.[2] A23C *9/14*

U.S. Cl. 426—231 14 Claims



1. A method of producing standardized milk with a given fat content from whole milk, said method comprising the steps of:

separating said whole milk into skim milk and cream;

passing said skim milk along a path without substantial temperature change;

measuring at an upstream measuring location in said path the density of said skim milk and producing a skim-milk output corresponding to the measured density;

introducing into said path at a mixing location downstream of said measuring location and mixing with said skim milk a variable portion of said cream;

measuring at a downstream measuring location downstream of said mixing location in said path the density of the mixture of said skim milk and said variable portion of said cream and producing a mixture output corresponding to the measured density of said mixture, whereby the variation between said mixture and skim-milk outputs is substantially only indicative of the fat content of said mixture; and

comparing said outputs and varying the size of said variable portion in dependence on the variation between said outputs so as to impart to said mixture said given fat content.

4,075,356

CEREAL PROCESS AND PRODUCT

Robert A. Haag, Marietta, Ga.; Patrick M. Rousseau, Lansing, and Thom O. Martin, Richland, both of Mich., assignors to General Foods Corporation, White Plains, N.Y.

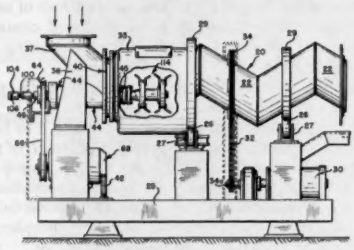
Continuation of Ser. No. 433,628, Jan. 16, 1974, abandoned. This application Aug. 21, 1975, Ser. No. 606,672

Int. Cl.[2] A23B *4/10*

U.S. Cl. 426—285 9 Claims

1. A process for agglomerating granular material having dissimilarly sized and shaped food particles of varying densities which comprises: charging said material and a discrete granular tackifying liquid-activatable composition to a first zone in a rotating vessel wherein said material is tumbled; centrifugally and continuously discharging from a rotating first spray head radially within said first zone a finely dispersed array of drop-

lets of a first liquid, the rotational rate of the vessel being such in relation to the rate of discharge from the first spray head as to cause tumbling material to cascade into and be intercepted by said droplets and be coated thereby by migration through the particles and absorption therein, said coating action being promoted by paddles that rotate with said head and churn the particles undergoing said coating action by mechanically throwing the particles radially and axially; advancing the tumbling churned coated particles in said vessel to a second zone distinct from said first zone wherein they are contacted by a continuously and centrifugally finely dispersed discharged



array of droplets of an adhesive second liquid from a second rotating spray head within said vessel whereupon the adhesive and tackifying properties of the previously coated particles are activated causing aggregation thereof, said second liquid having a composition different from the first liquid, said aggregating action being promoted by second paddles that rotate with said head and cause mechanical throwing of the coated particles radially and axially to effect churning, mixing and aggregation; and continuing rotation of said vessel to discharge the aggregates to an undulation zone wherein they are subjected to successive changes in direction and agglomerated into chunks of lower density than said aggregates.

4,075,357

INTERMEDIATE MOISTURE MEATS

Alina Surmacka Szczesniak, Mount Vernon, and Wei-Wen Mao, Ossining, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,571
Int. Cl.[2] A23B *4/00, 4/02*
U.S. Cl. 426—332 **25 Claims**

1. An intermediate-moisture meat product comprising meat containing from 15 to 50% moisture which is normally subject to bacterial growth, having incorporated therein a preservation system comprising at least one primary salt selected from the group consisting of sodium chloride and potassium chloride and at least one secondary salt selected from the group consisting of alkali metal salts of edible hydroxy carboxylic acids, alkali metal orthophosphates, alkali metal metaphosphates, alkali metal ultraphosphates, alkali metal polyphosphates and any combination of these, the weight ratio of the primary salt to the secondary salt being from 1:3 to 3:1, and the total weight of primary salt and secondary salt being from 6 to 13% of the weight of the product.

4,075,358

PROCESS FOR REDUCING COMBUSTION PRODUCT RESIDUES IN PRODUCTS DRIED BY A DIRECT FLAME UNIT

Ronald L. Madl, Webster Groves; Frank J. Simon, St. Charles, and Jerry T. Ortinau, St. Louis, all of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Dec. 29, 1976, Ser. No. 755,414
Int. Cl.[2] A23B *7/00, 4/04*
U.S. Cl. 426—465 **9 Claims**

1. In a process for the air drying of a food material, wherein drying air is heated by direct contact with a burner and thereafter a food material is contacted with said drying air, the improvement comprising reducing levels of burner combustion products in said food material by the steps of;

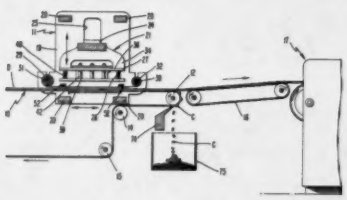
a. forming a combustible fuel mixture by mixing a combustible fuel with a stoichiometric quantity of air to provide for substantially complete combustion of said fuel;
b. feeding said mixture to a burner in an amount effective to provide a burner output which does not exceed 800,000 BTU/hr. lineal ft. of burner and combusting said mixture to provide a drying air temperature of at least about 330° F., said drying air having a velocity of at least about 2,000 ft./min. and
c. shielding the flame formed by combustion of said mixture from said drying air such that aeration of said flame by said drying air for purposes of combustion is substantially reduced.

4,075,359

METHOD OF FORMING PERFORATED FLAT DOUGH PIECES

Robert R. Thulin, Friendswood, Tex., assignor to Nabisco, Inc., East Hanover, N.J.

Filed Oct. 14, 1976, Ser. No. 732,191
Int. Cl.[2] A21C *11/10, 11/12;* **A21D** *6/00*
U.S. Cl. 426—502 **9 Claims**



1. The method of forming a continuous flat dough piece subdivided to define individual product pieces and having perforations of substantial size formed in the product pieces comprising the steps of forming a continuous flat dough sheet, transporting the dough piece on a belt of a material to which the dough will adhere in response to pressure, moving cutting elements through said dough to subdivide the sheet to define individual product pieces and simultaneously cut out sections of dough and press the cut out sections to the belt with sufficient force to cause adhesion thereto, separating the dough piece from the belt without disturbing the cut out sections thus providing perforations in the flat dough piece, and then removing the cut out sections from the belt, each dough section cut out of said product pieces being cut out by a tubular cutting element having an inner and outer wall and a cutting edge defined by the junction of the outer wall and an inclined surface that extends inwardly and upwardly from the cutting edge into the inner wall so as to force the dough inwardly by the inclined surface of the cutting edge downwardly and inwardly to cause the dough section to adhere to the conveyor.

4,075,360

PREPARATION OF IMITATION MOZZARELLA CHEESE

Charles E. Rule, Lakewood, and Charles E. Werstak, Medina, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 489,583, July 18, 1974, abandoned. This application Dec. 20, 1976, Ser. No. 752,260
Int. Cl.[2] A23C *19/02, 19/12*
U.S. Cl. 426—582 **9 Claims**

1. The method of producing an imitation mozarella cheese characterized as being sufficiently hard to be gratable and

having the stretch, flavor, melt-down, and browning characteristics of natural mozzarella cheese, comprising the steps of:

a. preparing a cheese formulation which consists essentially of about 15–35% edible protein which includes about 70–100% sodium caseinate and up to about 30% calcium caseinate, about 0.5–1.0% of a calcium ion providing substance other than a calcium protein salt, about 45–53% water, up to about 3% organic emulsifying agent, about 0.2–3% of an edible acid, and about 15–30% of a vegetable oil, said vegetable oil having a Wiley Melting Point of about 60°–120° F, said edible acid being present in an amount sufficient to establish a pH of about 6–5; wherein said formulation is prepared by the steps of

1. preparing a first water mix consisting essentially of the water, a portion of the caseinate protein and other water soluble or dispersible ingredients;
2. preparing a second oil mix consisting essentially of the oil, the remaining portion of the caseinate protein and other oil soluble or dispersible ingredients;
3. separately heating said mixes to a temperature of about 130°–172° F, and thoroughly stirring the same; and
4. combining said mixes and adding said edible acid to the combined mixes to provide said pH;

b. thoroughly stirring the resulting mixture at a temperature of about 135°–170° F; and

c. cooling the resulting mixture until a hardened product is obtained.

4,075,361

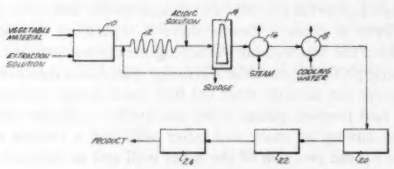
PROCESS FOR PREPARING STABLE FULL FAT OILSEED EXTRACT

Elmer B. Oberg, Camarillo, Calif., assignor to Paul Taylor Co., Pasadena, Calif.

Continuation-in-part of Ser. No. 614,486, Sept. 18, 1975, abandoned. This application Nov. 26, 1976, Ser. No. 745,488

Int. Cl.[2] A23L *1/20*

U.S. Cl. 426—655 **53 Claims**



17. A process for preparing a stabilized, full fat, high protein edible extract from an oilseed comprising the steps of:

a. comminuting one part by weight full fat oilseed in the presence of from about 3 to about 15 parts by weight of a hot alkaline extraction solution with a temperature of at least about 180° F and a sufficiently high pH from about 8 to about 13 so that the comminuted oilseed/extraction solution mixture is alkaline;

b. soaking the comminuted oilseed in the extraction solution for from about 1 to about 20 minutes;

c. neutralizing with an acidic solution and clarifying the comminuted oilseed/extraction solution mixture to yield an essentially clear extract and a sludge; and

d. heating the clear extract to a sufficient temperature to destroy anti-nutritional factors.

4,075,362

METHOD FOR PROVIDING HEATED FUSER ROLL WITH IMPROVED RELEASE AND WEAR LIFE

Thomas P. Concannon, Newtown Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 508,667, Sept. 23, 1974, abandoned. This application Aug. 13, 1976, Ser. No. 714,270

Int. Cl.[2] G03G *13/20*

U.S. Cl. 427—22 **13 Claims**

1. In a xerographic printing process, wherein the image particles are fused onto a supporting sheet by passing said sheet between a pressure roll and a heated fuser roll, the image particles come into contact with the metal surface of said fuser roll; the improvement consisting essentially of continuously applying to said surface a layer of an offset preventing composition consisting essentially of

(A) 5 to 30% by weight, based on the weight of (A) plus (B), of I, II or a mixture of I and II; wherein

(I) is a perfluoroolefin polymer containing 5 to 100% by weight, based on the perfluorolefin polymer, of tetrafluoroethylene and 95 to 0% by weight, based on the perfluoroolefin polymer, of hexafluoropropylene and

(II) is a fluorosurfactant, wherein said fluorosurfactant is a mixture of mono- and di- esters of phosphoric acid prepared with an alcohol of formula $F(CF_2CF_2)_nCH_2CH_2OH$, where n is from 3 to 8;

admixed with

(B) 95 to 70% by weight based on the weight of (A) plus (B) of a silicone oil dispersing agent, wherein said dispersing agent has surface tension of 16 to 30 dynes/centimeter, viscosity range of 0.5 to 100,000 centistokes at 25° C, and a maximum vapor pressure of 200 mmHg at 205° C.

4,075,363

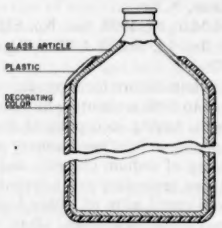
METHOD OF MAKING COLOR DECORATED, PLASTIC COATED GLASS ARTICLES

Herbert C. Shank, Jr., Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Division of Ser. No. 378,493, July 12, 1973, Pat. No. 3,937,853. This application May 5, 1975, Ser. No. 574,383

Int. Cl.[2] B05D *1/04*

U.S. Cl. 427—27 **11 Claims**



1. A method of permanently decal decorating a glass container at temperatures lower than required for glazing, comprising,

applying a thermal release decal by a decal transfer process directly onto an outside surface region of a preformed glass container, the decal requiring heating to a temperature higher than about 150° F to bond permanently to the glass surface,

maintaining said container with the said decal thereon at a temperature below the temperature effective for such permanent bonding to occur,

then coating a finely divided heat settable plastic resin onto said glass container, the said plastic resin being coated over the applied decal and extending on said glass surface beyond the surface region on which said decal has been applied,

then anchoring said plastic resin to said glass container and

the decal by heating the decorated and thus coated container to set the resin so that it forms a smooth continuous film,

and cooling the container,

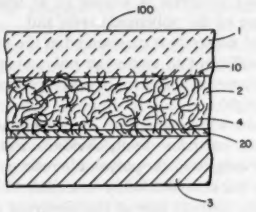
the resultant plastic film being supported by and anchored to the surface of said glass container beyond the region covered by said decal,

thereby producing a final permanently decorated glass container wherein said film provides a permanent outer covering over said decal which encloses and protects the latter on the glass surface, the decal being captured between the film and the glass surface.

4,075,364
POROUS CERAMIC SEALS AND METHOD OF MAKING SAME

Carlino Panzera, Belle Mead, N.J., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 15, 1976, Ser. No. 677,258
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—34 **2 Claims**



1. A method of making a ceramic-metal composite comprising the steps of:

(a) providing a metal plate and a metal pad having a density of ranging from 5 to 80%;

(b) bonding the pad to be the metal plate;

(c) plasma spraying on the exposed surface of the metal pad a mixture of ceramic material and a sacrificial material where the volume fraction of the sacrificial material is increased from zero percent to 60 percent at convenient intervals to effect strength and porosity required; the sacrificial material being selected from one or more, but not limited to the following: graphite, plastic, aluminum, copper and sawdust; the inert ceramic layer being selected from one or more, but not limited to the following:

stabilized zirconia, calcia, magnesia, yttria, glass, silicon carbide, silicon nitride, alumina, mullite, borides, silicides, and cermets;

(d) removal of sacrificial material by a chemical reaction such as oxidation or leaching.

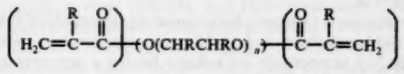
4,075,365
TURQUOISE-PLASTIC-COMPOSITE

Homer Breault, and Alvin E. Witt, both of Pine Glen, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 14, 1976, Ser. No. 648,842
Int. Cl.[2] B05D *3/06;* **A44C** *17/00*
U.S. Cl. 427—36 **8 Claims**

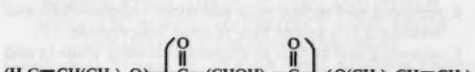
1. The method of enhancing the attractiveness of turquoise gems having impregnatable pores containing sorbed moisture which method consists essentially of the steps of:

impregnating a turquoise gem with a liquid monomeric diester formed by the esterification of two moles of a monoolefinic monomer and one mole of a difunctional reactant, said difunctional reactant having a plurality of supplemental hydrophillic groups of the class consisting of hydroxy groups and ether groups, said diester having a volatility corresponding to a boiling point within the range from about 150° C. to 300° C., said diester corresponding to either the formula:



in which each R is independently selected from hydrogen or a methyl group, except that each alkoxy group has not more than one methyl group, and in which n has a value of 3 or 4,

or the formula:



in which m is 1 or 2, and in which q is 2, 3 or 4;

polymerizing the monomeric diester thus impregnated into the turquoise gem to provide a solid plastic turquoise composite, at least some of the moisture sorbed in said turquoise gem being encapsulated within the plastic by reason of the presence of said plurality of hydrophillic groups in said difunctional reactant.

4,075,366
LOW GLOSS RADIATION CURE

Eugene S. Packer, Chicago, and George J. England, Hillside, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

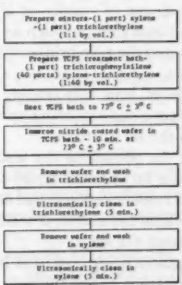
Continuation-in-part of Ser. No. 694,935, June 11, 1976, abandoned. This application Oct. 21, 1976, Ser. No. 734,425
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—44 **22 Claims**

1. A method of obtaining a low gloss radiation-cured coating comprising applying an aqueous emulsion coating composition to a substrate, said emulsion being constituted by water having emulsified therein viscous droplets comprising radiation curable resin, and subjecting said applied emulsion to radiation energy to cure the same before the emulsion breaks.

4,075,367
SEMICONDUCTOR PROCESSING OF SILICON NITRIDE

Michael R. Gulett, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Mar. 18, 1976, Ser. No. 668,167
Int. Cl.[2] H01L *21/304, 21/306*
U.S. Cl. 427—94 **4 Claims**


Prepare mixture-(1 part) xylene -(1 part) trichlorethylene (1:1 by vol.)
Prepare TCPS treatment bath-(1 part) trichlorophenylsilane (40 parts) xylene-trichlorethylene (1:40 by vol.)
Heat TCPS bath to 73° C ± 3° C
Immerse nitride coated wafer in TCPS bath - 10 min. at 73° C ± 3° C
Remove wafer and wash in trichlorethylene
Ultrasonically clean in trichlorethylene (5 min.)
Remove wafer and wash in xylene
Ultrasonically clean in xylene (5 min.)
Spin dry in dry N_2 atmosphere
Bake - 65 minutes at 150° C ± 10° C
Apply photoresist

1. A method of preparing a silicon nitride surface on a semiconductor device for improving the adhesion of photoresist

material to withstand a hydrofluoric acid etchant, comprising the steps of:

a. preparing a treatment bath consisting essentially of xylene, trichlorethylene, and trichlorophenylsilane in a ratio of 20:20:1 respectively by volume having a temperature of from 70° C to 76° C;
b. immersing said surface in said bath for about 10 minutes;
c. removing said surface from said bath and washing it in a trichlorethylene bath at room temperature;
d. subjecting said surface to ultrasonic cleaning while in said trichlorethylene bath;
e. removing said surface from said trichlorethylene bath and washing it in a xylene bath at room temperature;
f. subjecting said surface to ultrasonic cleaning while in said xylene bath;
g. removing said surface from said xylene bath and spin drying it in a nitrogen atmosphere at room temperature; and
h. baking said surface for about 45 minutes at a temperature of 140° C to 160° C.

4,075,368

BATTERY TERMINAL CONSTRUCTION

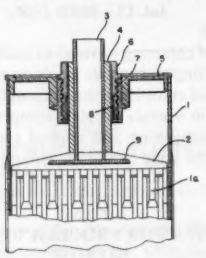
Klaus Salamon, Kelkheim, and Rudolf Eckardt, Steinbach, both of Germany, assignors to Varta Batterie A. G., Germany

Filed May 26, 1976, Ser. No. 690,267

Claims priority, application Germany, June 25, 1975, 7520197[U]

Int. Cl.² H01M 2/06

U.S. Cl. 429—161 **6 Claims**



1. A terminal construction for a storage battery having a pole bridge connecting electrode plates within the battery and a lid through which the terminal extends, said construction comprising:

a hollow, tubular sleeve of copper or aluminum extending from above the battery lid, through an aperture in said lid all the way down to the pole bridge onto which the end of the sleeve is cast,

an annular mantle of lead surrounding and cast into the outside of the sleeve and extending upward from said pole bridge through the lid aperture,

means for sealing the portion of the lead mantle which extends through the lid aperture liquid-tight in the lid,

an annular lead terminal receptacle, set into and surrounding the mantle to which the mantle is welded in the region of its passage through the lid,

the terminal receptacle being coated at least on that portion of its outside where it passes through the lid with a synthetic plastic, and

the synthetic plastic coating extending around the bottom of the lead terminal receptacle and upwardly along at least a portion of its inner surface between receptacle and mantle, thereby to accommodate to slight variations in the outside of the lead mantle of the sleeve forming a tight seal around that mantle.

4,075,369

METHOD OF COATING WITH WATER DISPERSIBLE, LOW MOLECULAR WEIGHT POLYAMIDE RESIN PARTICLES OF UNIFORM SIZES

Charles F. Ferraro, Trenton; Richard A. Javick, Princeton Junction, both of N.J., and James A. Robertson, Levittown, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 492,609, July 29, 1974, abandoned, which is a division of Ser. No. 248,063, April 27, 1972, Pat. No. 3,844,991. This application Apr. 30, 1976, Ser. No. 681,826

Int. Cl.² B05D 1/24, 3/02

U.S. Cl. 427—185 **8 Claims**

1. In a method of providing a substrate with a self-adherent coating of a high molecular weight, linear polyamide wherein

(1) the substrate is coated with a dispersion comprising water, finely-divided, water dispersible, low molecular weight, linear polyamide resin particles, between about 0.15% and about 0.8%, based upon the weight of the resin, of a catalyst consisting of a non-volatile, strong acid or a compound which upon heating is converted to a non-volatile, strong acid and between about 1% and 8%, based upon the weight of the resin, of a flow promoter,

(2) the coated substrate is heated to at least the melting temperature of the polyamide resin and

(3) the heated substrate is maintained at the temperature for a period sufficient to cause the polyamide resin to flow and to polymerize the resin to a predetermined high molecular weight,

the improvement which comprises employing as the dispersed polyamide resin particles, finely-divided, water dispersible, low molecular weight, linear polyamide resin particles consisting of loosely packed, randomly oriented, clusters of flaky sheets, the mean particle size of the dispersed particles being between about 0.03 micron and about 6 microns and the particle size distribution being about $d + 0.8\,d$, where d is the mean particle size.

4,075,370

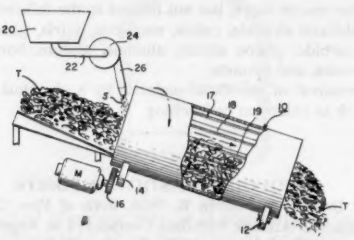
PASSIVATING METALLIC CUTTINGS AND TURNINGS

Richard D. Burlingame, Cleveland Heights, Ohio, and Michael Markels, Jr., Springfield, Va., assignors to Ogden Metals, Inc., Cleveland, Ohio and Versar, Inc., Springfield, Va.

Filed Apr. 28, 1976, Ser. No. 680,830

Int. Cl.² C23F 9/02

U.S. Cl. 427—216 **5 Claims**



1. The method of passivating iron-containing cuttings and turnings materials to prevent overheating thereof as a result of the materials having been disturbed by being moved and compressed while wet into bulk confinement for storage or transportation thereof, comprising the steps of:

(a) preparing an aqueous slurry of an alkaline calcium compound comprising an oxide or hydroxide thereof;

(b) tumbling said materials while moving them into said confinement, and introducing into the tumbling materials a quantity of said slurry in the range of 1% to 5% by weight; and

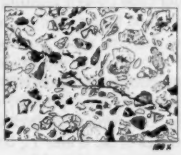
(c) continuing said tumbling until the materials are substantially coated with the slurry.

4,075,371

WEAR RESISTANT ALLOY COATING CONTAINING TUNGSTEN CARBIDE

Mahesh S. Patel, Albertson, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Division of Ser. No. 594,943, July 11, 1975, Pat. No. 4,013,453. This application July 29, 1976, Ser. No. 709,705
Int. Cl.[2] B05D 1/08
U.S. Cl. 427—224 5 Claims



1. A method of hard facing a metal substrate with an alloy coating material adapted to impart improved resistance to wear and abrasion to said metal substrate which comprises,

flame spraying a fusible powder mixture onto a metal substrate by means of a flame-spraying torch,

said powder mixture comprising an atomized nickel-base alloy powder of minus 100 mesh having substantially uniformly blended therewith a powder comprising agglomerates of nickel powder intimately combined with tungsten carbide powder, said agglomerates being minus 150 mesh in size, the nickel powder and tungsten carbide powder in said agglomerates each having an average particle size ranging from about 0.1 to 10 microns,

the amount of tungsten carbide in said agglomerates ranging from about 70% to 90% by weight, with the nickel powder in said agglomerates ranging from about 30% to 10% by weight,

the ratio of said agglomerates to said nickel-base alloy powder in said mixture being such that the total mixture has an average tungsten carbide content of about 10% to 30% by weight,

the composition of said nickel-base alloy powder in said mixture comprising by weight about 2.5 to 20% Cr, about 0.5% to 6% Si, about 0.5% to 5% B, up to about 10% Fe and the balance essentially nickel,

maintaining a flame on said deposited hard facing alloy to assure a molten deposit on said substrate,

and then allowing said molten deposit to solidify,

whereby a hard coating is obtained metallurgically bonded to said metal substrate characterized metallographically by a substantially fine uniform dispersion of hard particles comprising tungsten carbide of average size not exceeding 10 microns dispersed through a nickel-base alloy matrix at an average interparticle spacing of less than about 15 microns.

4,075,372

FLEXIBILITY ENHANCING COATING FOR BOXBOARD, PARTICULARLY OF CARTON JOINTS AND FOLD LINES, AND METHOD OF APPLICATION

Robert M. Wilkinson, Florissant, Mo., assignor to Alton Box Board Company, Alton, Ill.

Filed Apr. 29, 1975, Ser. No. 572,878
Int. Cl.[2] B05D 1/38; B32B 29/06, 3/02
U.S. Cl. 427—258 9 Claims

1. The method of improving the resistance of boxboard to moisture absorption particularly at its fold areas, comprising the steps of initially coating the intended exterior surface of the boxboard through the use of a printing roller with a dryable flexible film forming material of a thermoplastic resin to form a stretchable membrane thereon, said flexible film forming material of a thermoplastic resin being selected from the group consisting essentially of polyvinyl acetate, ethylene vinyl acetate, ethylene vinyl chloride, and their copolymers thereof, with said flexible film forming material having the characteristic to exceed a percentage of elongation in excess of 350, heating said applied film to achieve its drying, and then applying over said coated film after drying a lacquer exhibiting moisture barrier properties.

4,075,373

METHOD FOR LINING CAR, TRUCKS AND SHIP BODIES, STEEL TUBES, PLATES AND OTHER METALLIC BODIES TO PROTECT SAME FROM ABRASION, CORROSION AND HEAT

Godofredo G. Monsod, Jr., 39 K-4th Street, Kamuning, Quezon City, Philippines

Continuation-in-part of Ser. No. 527,391, Nov. 26, 1974, abandoned. This application Sept. 21, 1976, Ser. No. 725,064
Claims priority, application Philippines, Nov. 26, 1973, 15256
Int. Cl.[2] B05D 3/02, 3/12, 3/10
U.S. Cl. 427—327 4 Claims

1. A method for lining metal bodies and surfaces to protect the same from abrasion, corrosion and heat comprising:

(a) scrubbing or sanding the metal surface to be lined until the metal surface is thoroughly cleaned and rendered smooth;

(b) applying on the metal surface a coating of a solvent mixture comprising 80 parts of ethylene dichloride, 10 parts acetone, 10 parts benzol and thereafter allowing said applied solvent mixture to dry;

(c) applying on the resulting coated metal surface three (3) coatings of a rubber cement mixture having the following formula:

Isobutylene Isoprene Rubber	100 parts
Polyacrylate Rubber	5 parts
Zinc Oxide	5 parts
Heavy Magnesium Oxide	0.5 parts
Sulfur	2 parts
Dibenzothiazoledisulphide	0.5 parts
Tetramethylthiuramdisulphide	1 part

drying the rubber cement coat, before applying each subsequent coating of said rubber cement.

(d) applying a first coating of a compounded rubber composition essentially containing rubber, effective amounts of modifiers, extenders and accelerator of a thickness of about 0.02 inches uniform throughout the entire surface and then pressing the thus applied coating on to the contours and shape of the metal body, thereafter applying a coating of the ethylene dichloride solvent mixture of step (b) and then allowing the same to dry;

(e) applying a second and final coating of the rubber composition of step (d) of a uniform and desired thickness and then applying a final coating of a rubber cement mixture of step (c) and allowing the same to dry, and

(f) finally, setting the rubber lining to self cure in situ.

4,075,374

FLOOR PREPARATION AND METHOD

Clyde R. Jorgenson; Harold M. DeBoer, and Ronald M. Jorgenson, all of Minneapolis, Minn., assignors to Acoustical Floors, Inc., Hamel, Minn.

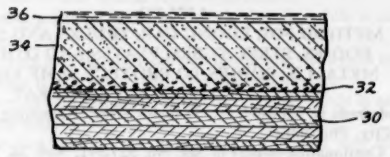
Filed July 30, 1975, Ser. No. 600,461
Int. Cl.[2] B05D 3/12
U.S. Cl. 427—355 4 Claims

1. Method of rapidly providing an acoustic floor covering over a subfloor, the method comprising

a. providing a thoroughly mixed slurry comprising 10 parts by weight of pressure-calcined calcium sulfate hemihydrate, 38–48 parts by weight of sand, a hardening amount of an aqueous latex polymeric dispersion, an antifoam agent substantially preventing foam production upon

violent mixing of the slurry, and sufficient water in the range of about 4 to about 10 parts by weight to provide the slurry with a watery, easily dripping, runny, self-leveling consistency;

b. pouring the watery slurry onto the subfloor to a predetermined thickness, the slurry flowing easily into a substantially level and uniform layer upon the subfloor;



c. lightly floating the surface of the watery slurry layer with a wooden float to provide the slurry layer with a top surface rich in latex and calcium sulfate hemihydrate, water in the slurry forming in a layer upon, and evaporating from, the top surface of the slurry layer as the latter sets up to provide a high-density, smooth, chip-resistant floor having low sound transmissivity and a hard upper surface.

4,075,375

CLEANING MATERIAL AND PROCESS FOR PREPARATION THEREOF

Toshiyoshi Komatsu, Osaka, Japan, assignor to Duskin Franchise Co. Ltd., Osaka, Japan

Filed Jan. 30, 1976, Ser. No. 653,735

Int. Cl.[2] B05D *3/02*

U.S. Cl. 427—390 R **18 Claims**

1. A process for the preparation of cleaning materials comprising a cleaning fibrous substrate and an oiling composition adsorbed and impregnated in said fibrous substrate, said process comprising contacting a cleaning fibrous substrate composed of cellulose fibers or a combination of up to 30% by weight, based on the fibers, of synthetic fibers and the remainder of cellulose fibers with an oil-in-water emulsion of an oiling composition consisting essentially of (a) an oiling agent composed of mineral oil, a synthetic lubricating oil or a mixture thereof and having a viscosity of 8 to 100 cps as measured at 100° F, (b) 0.5 to 35% by weight, based on the total oiling composition, of an amphoteric surface active agent or a surface active agent having in the molecule both cationic active and non-ionic active groups and (c) 1 to 4% by weight based on the total oiling composition, of a benzene-carboxylic acid ester having a solubility parameter of from 8 to 12.6, at a pH of 4.0 to 5.0, for a time of 5 to 20 minutes and sufficient for the emulsion to be rendered transparent, said oil-in-water emulsion having a particle size distribution in which the number of particles having a size smaller than 10μ occupies at least 85% of the total number of dispersed particles, the oiling composition being present in an amount of 0.5 to 35% by weight based on the fibrous substrate on the dry basis; dehydrating the thus oil-impregnated fibrous substrate so that the water content is lower than 70% by weight; and then drying the fibrous substrate.

4,075,376

BOILER TUBE COATING AND METHOD FOR APPLYING THE SAME

Frederick T. Jaeger, Rosemere, Canada, assignor to Eutectic Corporation, Flushing, N.Y.

Continuation-in-part of Ser. No. 567,091, April 11, 1975, abandoned. This application Apr. 1, 1976, Ser. No. 672,785

Int. Cl.[2] F16L *59/00*

U.S. Cl. 428—36 **8 Claims**

1. A method of extending the life of a boiler tube subject in use to corrosion, oxidation and erosion which comprises:

cleaning said boiler tube by grit blasting the surface thereof,

preheating said cleaned boiler tube preparatory to receiving an alloy coating thereon, spray coating an overlay on said boiler tube of a coating composition in the form of a powder mixture consisting essentially of 10% to 70% by weight of a refractory hard powder component selected from the group consisting of carbides of W, Si, V, Ti, B, Cr and Mo; nitrides of Si, B and Ti; borides of Cr. W, Mo, Ta and V; and silicides of B, Mo and Cb blended with 90% to 30% by weight of a self-fluxing matrix alloy powder selected from the group consisting of nickel-base, nickel-copper base, iron-base and cobalt-base alloys containing by weight at least one element from the group consisting of 0.5% to 6% silicon and 0.5% to 5% boron, and thereafter fusing said overlay to the surface of said boiler tube to provide a relatively void-free bonded coating characterized by improved resistance to corrosion, oxidation and erosion.

4. As an article of manufacture, a composite steel boiler tube comprising a fused protective overlay of a heat, corrosion and erosion resistant alloy consisting essentially of:

10% to 70% by weight of powder refractory hard component selected from the group consisting of carbides of W, Si, V, Ti, B, Cr, and Mo; nitrides of Si, B and Ti; borides of Cr, W, Mo, Ta and V; and silicides of B, Mo and Cb dispersed through 90% to 30% by weight of a matrix alloy selected from the group consisting of

a. 0.5 to 1.1% C, 3% to 6% Si, 3% to 4% B, 6% to 28% Cr, up to 5% Fe and the balance essentially nickel;

b. 0.01% to 0.1% C, 2% to 5% Si, 1% to 3% B, up to 2% Fe and the balance essentially nickel;

c. up to 0.2% C, 2% to 6% Si, 0.5% to 2% B, up to 1% Cr, up to 1.5% Fe, 20% to 40% Cu and the balance essentially nickel; and

d. 0.6% to 3% C, 0.3% to 2% Si, up to 3% B, 20% to 35% Cr, 4% to 14% W, up to 3% Fe, up to 5% Ni and the balance essentially cobalt;

said protective overlay being dense and relatively void-free.

4,075,377

COVERING FLOORS WITH STRIPPABLE CARPET

Lindsay Matthew Aitchison; Kenneth Arnold Sparks, and Earl Eugene Schuster, all of East Sydney, Australia, assignors to Monobond Australia Pty. Limited, East Sydney, Australia

Continuation of Ser. No. 488,799, July 15, 1974, abandoned. This application Mar. 19, 1976, Ser. No. 668,500

Claims priority, application New Zealand, July 23, 1973, 171456

Int. Cl.[2] B32B *33/00*

U.S. Cl. 428—95 **8 Claims**

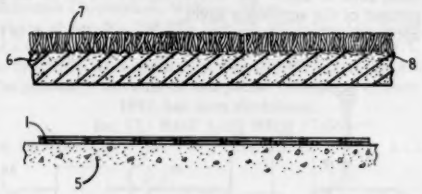
1. A floor covering comprising:

a first layer having a surface for carrying traffic;

a second layer secured to the first layer and providing a resilient foam backing which is to be laid on a floor and secured thereto by adhesive; and

a knitted open mesh of material having a multiplicity of openings therein accounting for a large proportion of the area of the mesh and located on the side of said second layer remote from said first layer for contacting the floor on which the floor covering is to be laid, whereby the application of an adhesive to the floor permits portions of said resilient foam backing to adhere to the floor through

said multiplicity of openings in the open mesh and by pulling on the open mesh said first and second layers



which are secured together, the floor covering may be peeled subsequently off the floor without leaving gross quantities of said foam backing adhering to the floor.

4,075,378

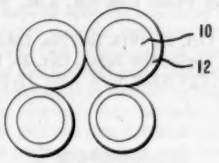
POLYAMIDE FILAMENTS WITH A BASIC-DYEABLE SHEATH AND AN ACID-DYEABLE CORE AND DYEING PROCESS THEREFOR

Anthony Anton, and Joseph Arthur Benoit Nolin, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 12, 1975, Ser. No. 612,730

Int. Cl.² B32B *3/02, 33/00*

U.S. Cl. 428—97 **10 Claims**



1. A synthetic polyamide filament composed of: an acid-dyeable fiber-forming polyamide core which constitutes at least about 40 volume percent of the filament and which contains from 40 to 100 equivalents of amine end-groups per 10^6 grams of the core polyamide; and, a substantially concentric, basic-dyeable, fiber-forming polyamide sheath which contains at least 50 equivalents of chemically attached aromatic sulfonate groups per 10^6 grams of the sheath polyamide.

4,075,379

MELT-EMBOSSED POLYMER FILM

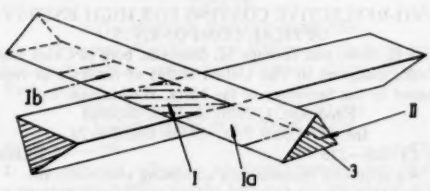
Ronald Lloyd, Sawbridgeworth, England, assignor to Smith & Nephew Plastics Limited, England

Filed June 18, 1975, Ser. No. 587,875

Claims priority, application United Kingdom, June 19, 1974, 27218/74

Int. Cl.² D04G *1/00*

U.S. Cl. 428—105 **8 Claims**



1. A net produced by biaxially stretching a melt-embossed film of synthetic polymeric material having on one surface a set of parallel grooves; on the other surface a second set of parallel grooves lying at an angle to the first set, said grooves being sufficiently deep to leave at the groove intersection areas a thin slittable membrane; the grooves in each set defining between themselves a set of parallel ribs; wherein the ratio between (I) the intersection area common to two ribs of different sets and (II) the cross-sectional area of each rib, is not greater than about 2:1 to ensure transmission of orientation through the rib intersection on subsequent stretching.

4,075,380

CONSTRUCTION PANELS

Joris Moens, Kortrijk, Belgium, assignor to N. V. Bekaert S. A., Zwevegem, Belgium

Filed Oct. 10, 1974, Ser. No. 513,832

Claims priority, application United Kingdom, Oct. 12, 1973, 47840/73

Int. Cl.² B32B *3/10*

U.S. Cl. 428—140 **9 Claims**

1. A construction panel comprising two substantially parallel sheets of concrete or mortar, said sheets being spaced apart and connected by bridging portions formed of concrete or mortar integral with said sheets, said bridging portions and at least the regions of said sheets at the respective ends of said bridging portions being reinforced with a multiplicity of randomly oriented metal fibers distributed therein, said sheets being otherwise substantially unreinforced, the cross sectional area of the bridging portions measured midway between said sheets comprising about 1–25% of the area of said panel, and a thermal insulating material filling the remainder of the volume between said sheets and surrounding said bridging portions.

4,075,381

LAMINATED GLASS WINDSHIELD AND METHOD OF MAKING SAME

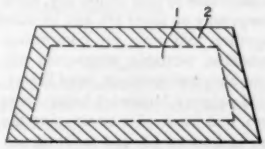
Yasuhiko Furukawa, and Tsuyoshi Igarashi, both of Tokyo, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Aug. 25, 1976, Ser. No. 717,687

Claims priority, application Japan, Sept. 9, 1975, 50-108529; Dec. 25, 1975, 50-153961

Int. Cl.² B32B *3/02, 27/42;* C03B *27/00*

U.S. Cl. 428—192 **3 Claims**



1. A laminated glass windshield, which comprises: two sheets of shaped plate glass bonded together by an interposed plastic layer wherein each of said glass plates has a thickness of 1.5 to 2.5 mm and has a plane compressive stress of 200 to 500 Kg/cm^2 on the peripheral portions of the outer surface within 15 mm of the outer edge of said plates and a tensile strength inside and adjacent said peripheral portions of less than 80 Kg/cm^2.

3. A method of making a laminated glass windshield, which comprises the steps of:

simultaneously shaping by heating two superimposed sheets

of glass plates having a thickness of 1.5 to 2.5 mm on a bending mold at 550° to 650° C;

quenching the glass plates at a quenching rate of 85° to 150° C/minute at least in an annealing zone from 450° to 550° C such that a plane compressive stress of 200 to 500 Kg/cm^2 is imparted to the peripheral portions of the outer surface of the glass plates within 15 mm of the outer edge of said plates;

arranging the glass plates such that between said plates is sandwiched a plastic layer and such that the face of each plate which has the plane compressive stress is faced outward; and

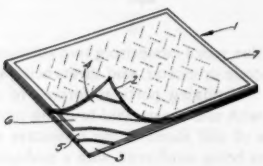
bonding the arranged glass plates by heat-pressing to form said laminate.

4,075,382

DISPOSABLE NONWOVEN SURGICAL TOWEL AND METHOD OF MAKING IT

Benjamin E. Chapman, Memphis, Tenn.; Danny R. Moore, Perry, Fla., and Arthur F. Phillips, Memphis, Tenn., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 27, 1976, Ser. No. 690,514
Int. Cl.[2] B32B *3/02, 7/14, 27/10*
U.S. Cl. 428—192 **26 Claims**



1. A disposable, sterilizable, surgical towel having a five-ply construction comprising a center ply of wettable microfibrous melt-blown fibers having a basis weight of from about 20 to about 60 grams per square meter and two identical primary laminates to each side of said center ply and each comprising an intermediate ply of wettable thermoplastic fibers having a basis weight of from about 10 to about 30 grams per square meter adhesively secured to a tissue ply having a basis weight of from about 10 to about 30 grams per square meter, said tissue plies comprising the outermost plies of said towel, said center ply and said primary laminates being bonded together about the periphery of said towel.

14. A disposable towel having a five-ply construction comprising a low density, soft, bulky, bendable, wettable, highly absorbent, nonwoven center ply and two identical primary laminates to each side of said center ply, each of said primary laminates comprising an inner ply and an outer ply adhesively adheared together, said inner ply comprising a medium density, soft, bendable, wettable, nonwoven ply, said outer ply comprising an abrasion resistant, low linting, soft, bendable, tissue ply, said primary laminates being characterized by fast strike through, said tissue plies comprising the outermost plies of said towel, said center ply and said primary laminates being bonded together about the periphery of said towel.

4,075,383

METHOD OF PATTERN BONDING A NONWOVEN WEB

Richard M. Anderson, Raleigh; Alton L. Caviness, Durham; Virginia C. Menikheim, Chapel Hill, and Bernard Silverman, Raleigh, all of N.C., assignors to Monsanto Company, St. Louis, Mo.

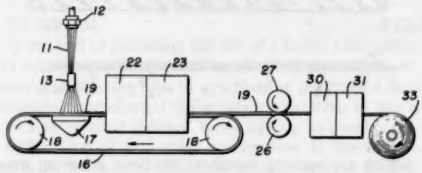
Filed Apr. 15, 1976, Ser. No. 677,183
Int. Cl.[2] B32B *7/14*
U.S. Cl. 428—198 **14 Claims**

1. The method of pattern bonding a nonwoven web made from polyamide filaments, comprising

a. advancing the web through first and second treatment zones,

b. applying an activating agent to the web in the first treatment zone to allow the web to absorb 0.1 to 20 weight percent of the activating agent,

c. applying sufficient water in vapor form to the web in the



second treatment zone to render the web unbondable when pressed at room temperature,

d. advancing the web between a pair of rolls at least one of which has raised portions which contact portions of the web, said raised portions being heated sufficiently to effect bonding in said portions of the web, and

e. removing said activating agent from the web.

4,075,384

MAGNETIC RECORDING TAPES WITH TWO-LAYERED MAGNETIC COATING

Masaaki Suzuki, and Akira Kasuga, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 21, 1976, Ser. No. 734,565
Claims priority, application Japan, Oct. 23, 1975, 50-127724
Int. Cl.[2] B32B *5/16, 7/02, 15/02*
U.S. Cl. 428—212 **15 Claims**

1. A magnetic recording tape comprising a non-magnetic support having thereon a two-layered magnetic coating composed of a ferromagnetic powder and a binder formed on one surface of said support, wherein the lower magnetic layer has a coercive force of about 250 to about 300 Oe, a residual magnetic flux density of at least about 1,500 Gauss and a dry thickness of at least about 2.5 μm, and the upper magnetic layer has a coercive force of about 350 to about 400 Oe, a residual magnetic flux density of not more than about 1,500 Gauss and a dry thickness of about 2.0 to 3.0 μm, the ferromagnetic powder contained in the upper magnetic layer having an APP value of not more than about 1.0 and wherein the ferromagnetic powder is a powder of a ferromagnetic iron oxide of the formula FeO_x wherein x is from 1.33 to 1.50.

4,075,385

ANTI-REFLECTIVE COATING FOR HIGH ENERGY OPTICAL COMPONENTS

Adrian D. Baer, and Terence M. Donovan, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1977, Ser. No. 783,883
Int. Cl.[2] B32B *7/00, 15/04;* **G02B** *5/26*
U.S. Cl. 428—215 **2 Claims**

1. An article of manufacture consisting essentially of:

A. a base selected from the group consisting of NaCl and KCl;

B. a layer of As_2Se_3 on said base;

C. a layer of NaF on said layer of As_2Se_3; and

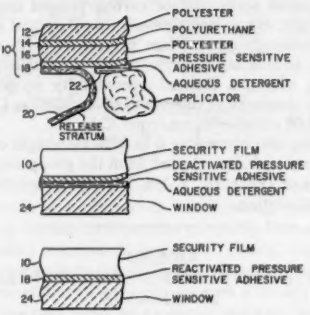
D. a layer of As_2Se_3 on said layer of NaF.

4,075,386

SECURITY FILM FOR SHATTERPROOFING WINDOWS

Michael E. Willdorf, Malden, Mass., assignor to Material Distributors Corporation, Woburn, Mass.

Division of Ser. No. 295,816, Oct. 10, 1972, Pat. No. 3,899,621, and a continuation-in-part of Ser. No. 113,426, Feb. 8, 1971, Pat. No. 3,775,226. This application July 21, 1975, Ser. No. 597,481
The portion of the term of this patent subsequent to June 24, 1992, has been disclaimed.
Int. Cl.[2] B44F *1/00;* B32B *17/06*
U.S. Cl. 428—216 6 Claims



1. A process for producing a security window, said process comprising the steps of applying a security film to a window surface with a polar aqueous detergent interposed therebetween, said security film comprising an assemblage of strata including at least one first polyester support stratum, at least one second polyester support stratum, at least one elastomeric bonding stratum, and only one nonpolar pressure sensitive adhesive stratum, said one first polyester support stratum and said one second polyester stratum each being composed of polyethylene terephthalate and ranging from 0.5 to 5 mils in thickness, said one elastomeric bonding stratum being composed of polyurethane and being interposed between said one first polyester support stratum and said one second polyester support stratum and in direct contact with the inner faces of said one first polyester support stratum and said one second polyester support stratum, said polyurethane bonding stratum ranging in thickness from 0.2 to 0.4 mil, said pressure sensitive stratum being coated on one of the outer faces of said assemblage for adhesion to said only one face of only one sheet of window glass, said pressure sensitive stratum being composed of a composition including a rubber and a tackifier and ranging in thickness from 0.5 to 1.5 mil, all of the strata of said assemblage being optically clear and moisture permeable, said pressure sensitive stratum being deactivated by said aqueous detergent, and permeating water from said aqueous detergent out of the interface between said security film and said window surface in order to reactivate said pressure sensitive adhesive stratum.

4,075,387

NON-WOVEN FABRIC BINDERS

Louis E. Trapasso, Watchung, and William B. Horback, Irvington, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed June 30, 1976, Ser. No. 701,314
Int. Cl.[2] B32B *27/04;* C08L *61/20*
U.S. Cl. 428—288 6 Claims

1. An aqueous polymer emulsion, suitable for binding loosely assembled fibrous webs into non-woven fabrics, which is prepared by over-polymerizing, in the presence of a polymerization catalyst and at elevated temperatures, a pre-formed aqueous ethylene-vinyl acetate copolymer emulsion containing about 70 to about 90 percent, by weight, vinyl acetate and about 10 to about 30 percent, by weight, ethylene, based on the total copolymer weight of the preformed emulsion, with about 10 to about 48 percent, by weight, vinyl acetate, and about 2 to about 6 percent, by weight, on an N-hydroxyalkyl(lower) acrylamide or methacrylamide, based on the total weight of the ethylene-vinyl acetate copolymer/vinyl acetate/N-hydroxyalkyl acrylamide or methacrylamide components.

4,075,388

ADHESIVE BONDING OF POLY(ARYLENE SULFIDE) SURFACES

Richard C. Doss, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 573,182, April 30, 1975, Pat. No. 4,011,121.
This application Oct. 18, 1976, Ser. No. 733,606
Int. Cl.[2] B32B *31/12, 7/12, 31/26;* B29C *17/12*
U.S. Cl. 428—297 9 Claims

1. A laminate structure comprising three layers,
the first layer consisting essentially of unfilled poly(arylene sulfide) having a flame-treated surface facing the second layer,
the second layer consisting of an adhesive connected to said flame-treated surface, and said third layer consisting of a solid material connected to said second layer of adhesive, said third layer being selected from the group consisting of metals, plastic materials, wood, ceramic materials, glass and concrete.

4,075,389

OPAQUE MICROCAPSULAR RELEASE SHEET

Anthony E. Vassiliades, Deerfield, and David N. Vincent, Glenview, both of Ill., assignors to Champion International Corporation, Stamford, Conn.

Filed Feb. 28, 1972, Ser. No. 230,088
Int. Cl.[2] B01J *13/02;* C09D *5/00;* B44D *1/02*
U.S. Cl. 428—306 22 Claims

1. An opaque release sheet which comprises a substrate having at least one surface coated with a release composition, said release composition comprising three separate ingredients, said first ingredient being a primary release agent consisting essentially of discrete, substantially spherical, air-containing microcapsules, said second ingredient being binder for adhering said microcapsules to said substrate, and said third ingredient being between about 1 and 30 percent by weight of said air-containing microcapsules on a dry basis of a secondary release agent, said secondary release agent improving the release properties of said release composition as compared with said release composition omitting said secondary release agent, said release sheet being capable of removal from a tacky surface when said coated surface is applied thereto without affecting the properties of said tacky surface or said surface coated with said release composition.

4,075,390

FUSING SURFACE AND METHOD FOR FIXING TONER

Richard J. Murphy, Norwood, Mass., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 497,409, Aug. 14, 1974, Pat. No. 3,997,691.
This application Oct. 4, 1976, Ser. No. 729,561
Int. Cl.[2] B05D *3/02;* B05D *3/12;* G03G *13/20*
U.S. Cl. 428—307 18 Claims

1. An article for use in a xerographic reproducing apparatus for fixing a resin-based powder image to a substrate at elevated temperatures, comprising a structure having a surface of silicone rubber having substantially no reinforcing filler and being capable of forming a degradation product in the presence of water at elevated temperatures and having an agent capable of supplying water dispersed therein in an amount which provides sufficient water to cause the degradation of the silicone rubber and the formation of the degradation product on the surface, said degradation product acting as a release material and having an adhesion for the resin-based powder which is

less than the adhesion which the fused resin-based powder has for the substrate.

18. A fuser member for an electrostatic copier comprising a structure having a substrate coated with a water-degradable silicone rubber having substantially no reinforcing filler and containing therein an agent capable of supplying water in an amount which provides sufficient water to cause the degradation of the silicone rubber at elevated temperatures, the surface of said coating comprising the degradation product of the silicone rubber, the degradation product being capable of acting as a release material for tackified resin-based powder or toner placed thereon.

4,075,391

PRODUCTION OF FERRITE ELECTROSTATOGRAPHIC CARRIER MATERIALS HAVING IMPROVED PROPERTIES

Allan C. Berg, Rochester; John W. Fitzpatrick, Fairport, and Lewis O. Jones, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1975, Ser. No. 626,907
Int. Cl.[2] G03G *9/14*
U.S. Cl. 428—407 **13 Claims**

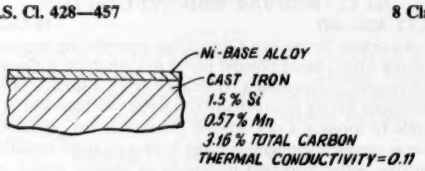
1. A process for preparing humidity-insensitive electrostatographic ferrite carrier materials comprising dry blending a mixture of ferrite forming metal oxides calcining the blended oxides in air at a temperature of up to about 2150° F for up to about 30 minutes to provide said blended oxides with a saturation magnetic moment of between about 6 to about 30 electromagnetic units per gram, milling the calcined oxides in a slurry to reduce the particle size of said calcined oxides to between about 0.8 micron and about 1.6 microns while adding to said slurry from about 0.02 to about 0.08 mole fraction of manganese oxide and about 0.001 to about 0.100 mole fraction of copper oxide based on all divalent metal oxides, a sodium-free deflocculant in an amount of from about 0.5 to about 2.0 percent by weight based on the weight of said metal oxides, and water to provide a slurry having about 80.0 percent by weight of solids, pumping the milled slurry to hold/feed tanks with continuous mixing while adding a binder material to said slurry in an amount of from about 0.2 to about 1.5 percent by weight based on the weight of said metal oxides, spray-drying said slurry to form substantially spherical beads, screening said beads to obtain particles having a controlled size, firing the screened particles in air at a temperature of up to about 2500° F for about 4 to about 8 hours to provide them with a saturation magnetic moment of about 48 electromagnetic units per gram, deagglomerating the fired particles, and screen said particles to obtain ferrite particles having surface sodium in an amount of less than about 20 parts per million, surface zinc in an amount of less than about 5,000 parts per million, and a BET surface area of between about 170 cm^2/gram and about 500 cm^2gram.

4,075,392

ALLOY-COATED FERROUS METAL SUBSTRATE

Frederick T. Jaeger, Rosemere, Canada, assignor to Eutectic Corporation, Flushing, N.Y.

Filed Sept. 30, 1976, Ser. No. 728,284
Int. Cl.[2] B32B *15/18*
U.S. Cl. 428—457 **8 Claims**



1. An alloy coated ferrous metal substrate,

said ferrous metal substrate having a thermal conductivity relative to silver taken as 1 at substantially ambient temperature of at least about 0.06 calories/sq.cm./cm/° C/sec,

said alloy coating being a fused flame sprayed, self-fluxing heat and corrosion resistant iron-group metal-base alloy metalurgically bonded to said ferrous meal substrate and having a thickness ranging from about 0.005 to 0.15 inch,

said iron-group metal-base alloy consisting essentially of a total of about 5% to 30% by weight of a strong boride and carbide-forming solute metal selected from the group of refractory metals consisting of W, Mo and Cr, up to about 3% C, about 0.5% to 5% B, about 0.1% to 6% Si and the balance essentially said iron-group metal,

the amount of boron and/or carbon present in said alloy being sufficient to combine with a substantial amount of said refractory metal when present to form secondary borides and/or secondary carbides, such as to provide a coating having a thermal conductivity at substantially ambient temperature relative to silver taken as 1 of at least about 0.05 calories/sq.cm/cm/° C/sec.,

said coating also containing 0 to 80% by weight of primary refractory carbides selected from the group consisting of carbides of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo and W based on the total coating.

4,075,393

MODIFIED TRIGLYCERIDE METAL WORKING LUBRICANTS

Robert J. Sturwold, Cincinnati, Ohio, assignor to Emery Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 627,852, Nov. 3, 1975. This application Jan. 13, 1977, Ser. No. 759,071
Int. Cl.[2] B32B *15/04, 15/20;* C10M *1/06*
U.S. Cl. 428—457 **5 Claims**

1. An aluminum or aluminum alloy product essentially free of surface stain and resistant to subsequent water stain having applied on the surface thereof a protective coating of a modified triglyceride obtained by transesterifying until the acid value is reduced by at least 25%, 50–84 parts triglyceride derived predominantly from C_{12}–C_{18} fatty acids, 2–36 parts polyoxyethylene glycol having an average molecular weight from about 200 to 1500 and 7–48 parts of an aliphatic or cycloaliphatic dicarboxylic acid containing 18 to 54 carbon atoms.

4,075,394

PROCESS OF INHIBITING TANNIN MIGRATION IN TANNIN-CONTAINING WOOD SUBSTRATES

Victor E. Meyer, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 8, 1976, Ser. No. 674,789
Int. Cl.[2] B05D *7/06;* B32B *21/08*
U.S. Cl. 428—537 **8 Claims**

1. A process of inhibiting tannin migration in a tannin-containing wood substrate comprising applying to the wood substrate an aqueous solution consisting essentially of between about 2 and about 50 weight percent polyalkylenimine.

4,075,395

HYBRID FRAMEWORK CONSISTING OF METALLIC PLATE AND PROJECTIONS MADE OF SYNTHETIC RESIN

Masanori Ohnishi, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

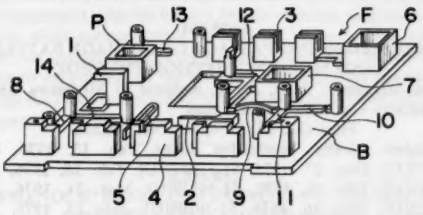
Filed Mar. 4, 1976, Ser. No. 664,037
Claims priority, application Japan, Mar. 7, 1975, 50-28531[U]; Mar. 7, 1975, 50-28532[U]; Mar. 7, 1975, 50-28533; Mar. 7, 1975, 50-28534; Mar. 19, 1975, 50-34066; Mar. 11, 1975, 50-33028[U]; Mar. 11, 1975, 50-33029[U]
Int. Cl.[2] B32B *9/04*
U.S. Cl. 428—542 **19 Claims**

1. A hybrid framework assembly for use in electrical or mechanical devices as a substratum and capable of being formed by a process of injection molding, and for supporting

various components incorporated in said devices, said hybrid framework assembly comprising:

a. a metallic base having opposite surfaces and at least one opening therein between said surfaces;

b. at least one projection on said metallic base plate and made of synthetic resin and having a base face thereof attached to said metallic base plate on a first of said surfaces of said metallic base plate adjacent said opening and



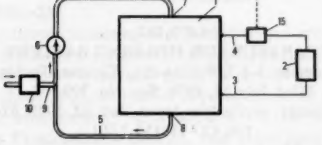
being larger than said opening and having a portion of said projection extending over said opening, said projection having a constricted portion integrally formed therewith extending into and through said opening, and a lump of synthetic resin on the second of said surfaces of said metallic base plate and integrally formed with said constricted portion, said lump of synthetic resin at least partially covering said opening for tightly holding said projection permanently on said metallic base plate.

4,075,396

METHOD AND DEVICE FOR FEEDING A FUEL CELL WITH A FLUID REACTANT

Alain Grehier, Paris, France, assignor to Institut Francais du Petrole, France

Filed Sept. 8, 1976, Ser. No. 721,217
Claims priority, application France, Sept. 17, 1975, 75 28900
Int. Cl.² H01M *8/04*
U.S. Cl. 429—17 **26 Claims**



1. A method of feeding a fuel cell with at least one fluid reactant, comprising circulating at least one fluid reactant through a closed loop including a fuel cell, introducing a make-up amount of fresh fluid into said loop, keeping at a substantially constant value the fluid pressure within the closed loop during the whole operating period of the fuel cell, automatically discharging, during a discharge period, a fraction of the fluid flowing through the loop and interrupting during a non-discharge period the discharge of said fluid from the loop, said discharge and non-discharge periods repeatedly following one another, wherein the flow rate of said discharged fluid has substantially the same value during all said discharge periods, said value being constant and wherein a time interval between the beginning of two consecutive discharge periods has a predetermined value.

4,075,397

CELL HAVING CHALCOGENIDE CATHODE AND SOLVATED ALKALI METAL SALT ELECTROLYTE

Robert W. Francis, Linden, and Gerald H. Newman, Westfield, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Mar. 1, 1977, Ser. No. 773,284
Int. Cl.² H01M *10/44*
U.S. Cl. 429—50 **13 Claims**

1. An electric current-producing cell, comprising:

a. an alkali metal-containing anode;

b. a cathode containing as its cathode active material, one or more chalcogenides of the empirical formula:

$$M'A_p$$

wherein M' is one or more metals selected from the group consisting of titanium, zirconium, hafnium, niobium, tantalum and vanadium, wherein A is one or more chalcogens selected from the group consisting of oxygen, sulfur, selenium and tellurium, and wherein p is a numerical value between about 1.8 and about 3.2; and

c. a solid electrolyte consisting essentially of one or more solvated compounds of the formula:

$$ZMX_n$$

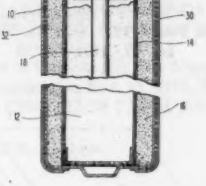
wherein Z is an alkali metal, wherein M is a metal selected from the group consisting of Zn, Cd, B, Al, Ga, In, Tl, Sn (stannous), P and As, wherein X is one or more halogens selected from the group consisting of chlorine, fluorine, bromine and iodine, and wherein n is a numerical value equal to one plus the valence of the metal M, said compounds having been solvated with one or more solvents selected from the group consisting of unsubstituted and inertly substituted monoethers and polyethers.

4,075,398

MEANS OF PROVIDING PRESSURE RELIEF TO SEALED GALVANIC CELL

Isaac I. Levy, Cambridge, Wis., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Oct. 26, 1976, Ser. No. 735,574
Int. Cl.² H01M *2/12*
U.S. Cl. 429—56 **8 Claims**



1. A sealed galvanic cell, comprising:

a generally tubular envelope having a mouth at one end thereof;

a mass of electrolyte disposed in said envelope;

an end cap having an inner and an outer surface and extending across the mouth of said envelope to seal the interior of the envelope, said end cap being formed of polysulfone;

said end cap defining a vent passage extending therethrough for allowing gases to escape from within said envelope;

a generally cylindrical plug formed of polysulfone disposed in said passageway, said plug having an uncompressed

diameter greater than the diameter of said vent passage to provide a compressive fit therewith;

the polysulfone of said end cap exhibiting a sufficiently low characteristic creep so that the pressure produced by the compressive fit remains substantially constant;

an outer cap assembly disposed over said end cap; and

terminal means extending through said end cap and into said electrolyte.

4,075,399

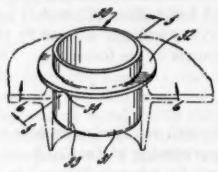
BATTERY VENT SEAL

Anthony Sabatino, St. Paul, and Purushothama Rao, Burnsville, both of Minn., assignors to Gould Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 486,662, July 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 377,563, July 9, 1973, Pat. No. 3,896,177. This application June 4, 1975, Ser. No. 583,672

Int. Cl.[2] H01M *2/12*

U.S. Cl. 429—57 **8 Claims**



1. For use with a lead acid battery having a cell and positive and negative plates containing formed active materials with a retained quantity of electrolyte and being closed except for a substantially cylindrical collar, a seal for relieving internal gas pressure while protecting the active materials from substantial oxidation, comprising a substantially cup-shaped member having a conical body adapted to be sealingly wedged into said collar, said member having a means communicating with the atmosphere and sized to allow, after a slight pressure build-up, venting of the gas from the battery sufficient to prevent bulging of the container that would cause permanent deformation thereof or ejection of the vent seal, said seal having a tear tab comprising a main portion integrally formed with said conical body, rupturing means defining said main portion and allowing said main portion to be partially separated from said conical body and a tab in-integrally formed with said main portion.

4,075,400

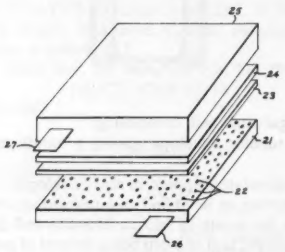
OVER TEMPERATURE BATTERY DEACTIVATION SYSTEM

David H. Fritts, 112 Beverly Place, Dayton, Ohio 45419

Filed Feb. 4, 1977, Ser. No. 765,557

Int. Cl.[2] H01M *6/50*

U.S. Cl. 429—62 **6 Claims**



1. The improvement in battery structure to deactivate the battery in locations within the battery where overheating and temperatures exceeding a predetermined safe value occur, the said battery having an electrode and a separator containing an electrolyte, the said improvement comprising:

a. a battery poisoning agent;

b. an encapsulant having a determined melting temperature approximately equal to the said safe value, encapsulating the said battery poisoning agent; and

c. means for positioning the said encapsulant encapsulating the said positioning agent between the said electrode and the said separator.

4,075,401

GAS-DISCHARGING PASSAGE OF STORAGE BATTERY AND MOLDING METHOD THEREOF

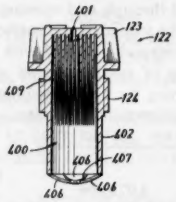
Shiro Miyagawa, Suita, Japan, assignor to Miyagawa Kasei Industry Co., Ltd., Osaka, Japan

Filed Oct. 28, 1976, Ser. No. 736,554

Claims priority, application Japan, Feb. 13, 1976, 51-15575[U]; Dec. 27, 1975, 51-179077[U]; Feb. 13, 1976, 51-16919[U]; Feb. 13, 1976, 51-16920[U]; Mar. 31, 1976, 51-40622[U]; June 16, 1976, 51-79208[U]; July 23, 1976, 51-98892[U]; Aug. 19, 1976, 51-112390[U]

Int. Cl.[2] H01M *2/12*

U.S. Cl. 429—89 **7 Claims**



1. A storage battery plug with a gas discharging passage which is integrally molded from a moldable material of substantial elasticity, including a cylindrical portion having a central axis and a given length, as well as screening members in said cylindrical portion, said screening members comprising a plurality of hair-like elements which are provided inwardly of the given length of the inner peripheral wall of said cylindrical portion, said hair-like elements being inclined downwardly and distributed closely together across the entire area along the peripheral direction so that the mass of said plurality of hair-like elements form funnel shaped means in said cylindrical portion.

4,075,402

APPARATUS FOR HOLDING BATTERY

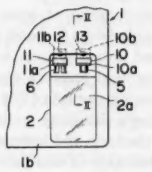
Shinobu Okamoto, 1-4-3, Yahata-cho, Koyama, Tochigi, Japan

Filed July 27, 1976, Ser. No. 709,187

Claims priority, application Japan, Jan. 22, 1976, 51-5155[U]

Int. Cl.[2] H01M *2/10*

U.S. Cl. 429—98 **2 Claims**



1. An improvement for an electrical apparatus for holding a battery which includes a pair of male and female terminals at one end thereof, the apparatus being of the type comprising a main body which includes a compartment therein for receiving

the battery and a pair of female and male circuit terminals extending into the compartment and arranged for engagement with the respective male and female terminals of the battery, the improvement comprising: first and second resilient, electrically conductive, plate springs rigidly secured at their end portions to the main body and extending into and terminating in the battery compartment, one of said plate springs carrying at its free end portion the female circuit terminal for engagement with the battery male terminal and the other of said plate springs carrying at its free end portion the male circuit terminal for engagement with the battery female terminal, said first and second plate springs being electrically isolated from each other, the compartment being sized so that when the battery terminals on one end of the battery are engaged by the plate springs the other end of the battery will engage a surface of the compartment opposite said plate springs.

4,075,403

PHENOLIC RESIN AND BATTERY SEPARATOR IMPREGNATED THEREWITH

William D. Burke, West Springfield; Harold P. Higginbottom, and John R. Le Blanc, both of Wilbraham, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 691,276, June 1, 1976. This application Jan. 21, 1977, Ser. No. 760,873

Int. Cl.[2] H01M *2/16*

U.S. Cl. 429—253 **7 Claims**

1. An improved cellulosic fibrous permeable battery separator impregnated with a resole resin composition comprising:

A. a resole resin formed as a reaction product of about 1.0 to 3.0 mols of formaldehyde per mol of phenol in the presence of an alkaline catalyst, the improvement comprising having present:

B. an alkaline hydroxy organic acid salt formed by neutralizing said resole resin with sufficient hydroxy organic acid to provide said resin with a pH of 7 to 9.

4,075,404

COPOLYMERS OF ALPHA-METHYLSTYRENE AND STYRENE AND USES THEREOF

Paul S. Douglas, Jefferson Township, Fayette County; Anargiros Pete Patellis, Rostraver Township, Westmoreland County, and Walter A. Vredenburgh, Pleasant Hills, all of Pa., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 333,215, Feb. 16, 1973, Pat. No. 3,932,332. This application Nov. 25, 1975, Ser. No. 635,482

Int. Cl.[2] C08F *4/14, 212/12*

U.S. Cl. 526—237 **6 Claims**

1. A copolymer consisting of α-methylstyrene and styrene as the sole monomers produced by copolymerization of, by weight, from about 90 parts to about 50 parts α-methylstyrene and from about 50 parts to about 10 parts styrene at a temperature range from about 15° C. to about 45° C. and in the presence of a Friedel-Crafts catalyst, said copolymer having a softening point (ring and ball) of under 100° C.

4,075,405

β-1,3-GLUCAN DERIVATIVES

Takeshi Takahashi, Tondabayashi; Yoshio Yamazaki, Toyonaka, and Koichi Kato, Neyagawa, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

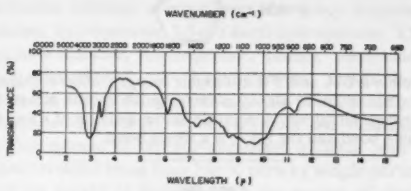
Filed Nov. 26, 1975, Ser. No. 635,450

Claims priority, application Japan, Nov. 26, 1974, 49-136477; Nov. 26, 1974, 49-136478; Oct. 21, 1975, 50-127197

Int. Cl.[2] A61K *31/71;* C08B *37/00;* C12D *13/04*

U.S. Cl. 536—1 **8 Claims**

1. A beta-1,3-glucan derivative, which is produced by reacting water-insoluble beta-1,3-glucan produced by microorganisms belonging to the genus Alcaligenes, the genus Agrobacterium or Poria cocos, with cyanogen halide in the presence of water and with the addition of an alkali in an amount such that the pH of the reaction system is sufficiently increased to prevent dissolution of said water-insoluble beta-1,3-glucan, said increase being in the range of about 0.2 to 0.5 pH unit/minute.



4,075,406

PROCESS FOR MAKING XYLOSE

Asko J. Melaja, and Lauri Hamalainen, both of Kantvik, Finland, assignors to Suomen Sokeri Osakeyhtio, Helsinki, Finland

Continuation of Ser. No. 463,037, April 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 354,391, April 25, 1973, abandoned. This application Aug. 28, 1975, Ser. No. 608,706

Int. Cl.[2] C07G *1/08;* C07C *31/18;* C13K *1/02;* C13D *3/14*

U.S. Cl. 536—1 **5 Claims**

1. A method for the production of xylose from a pentose-rich solution obtained by acid hydrolysis of a pentosan-containing raw material which comprises the steps of:

a. removing suspended solids from the solution by mechanical filtration;

b. removing inorganic salts and the major portion of organic impurities and color by ion exclusion;

c. removing the balance of color and other organic impurities by treating the solution with a material selected from the group consisting of an ion exchange resin and activated carbon; and

d. fractionating the solution thus obtained by ion exchange chromatographic techniques to provide a xylose solution of high purity.

4,075,407

HETEROCYCLIC PHOSPHONIUM SALTS

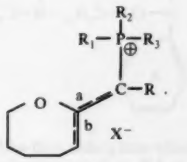
Richard A. Mueller, Northbrook, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 577,675, May 15, 1976, Pat. No. 3,997,588. This application Nov. 15, 1976, Ser. No. 741,909

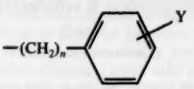
Int. Cl.[2] C07D *307/10, 313/04, 309/04*

U.S. Cl. 542—412 **20 Claims**

1. A compound of the formula



wherein R is hydrogen or an alkyl containing 1–3 carbon atoms, R_1, R_2 and R_3 is each an alkyl radical containing 1–6 carbon atoms, a cycloalkyl radical containing 5 or 6 carbon atoms, or a radical of the formula



wherein n is 0–4, and Y is hydrogen, halogen, alkyl containing 1–6 carbon atoms or alkoxy containing 1–6 carbon atoms; X^- is a pharmacologically acceptable anion; and one of a and b is a double bond and the other is a single bond.

4,075,408

IMIDAZOPYRAZOLODIAZEPINE COMPOUNDS

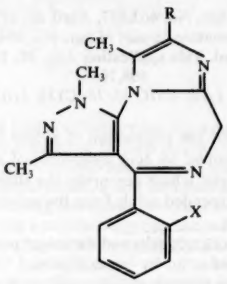
Donald E. Butler, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Continuation-in-part of Ser. No. 611,042, Sept. 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 521,318, Nov. 6, 1974, abandoned. This application June 17, 1976, Ser. No. 696,952

Int. Cl.[2] C07D *487/14*

U.S. Cl. 548—324 **6 Claims**

1. A member of the class consisting of compounds of the formula



and pharmaceutically acceptable acid-addition salts thereof; where R is hydrogen or methyl and X is hydrogen, fluorine, or chlorine.

4,075,409

BENZOPHENONE DERIVATIVES

Heinz Günter Greve, and Klaus Resag, both of Frankfurt am Main, Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

Filed Oct. 21, 1974, Ser. No. 516,428

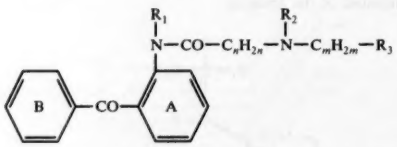
Claims priority, application Germany, Nov. 10, 1973, 2356239

The portion of the term of this patent subsequent to May 20, 1992, has been disclaimed.

Int. Cl.[2] C07C *103/50*

U.S. Cl. 560—36 **5 Claims**

1. A benzophenone derivative having the following structural formula



or a pharmaceutically-acceptable acid-addition salt thereof, in which each of R_1 and R_2 is, independently, a member selected from the group consisting of hydrogen and a saturated or unsaturated alkyl radical with from 1 to 4 carbon atoms, R_3 is a member selected from the group consisting of $—COOC_3H_7$, $—COOC_4H_9$ and $—COOC_6H_5$, n is 1 or 2, m is 1, 2 or 3, ring A is optionally substituted with a substituent selected from the group consisting of halogen, nitro, trifluoromethyl, methyl and methoxy, and ring B is optionally substituted with a substituent selected from the group consisting of chloro and fluoro.

4,075,410

Patent Not Issued For This Number

4,075,411

VINYL-POLYMERIZABLE SURFACTIVE MONOMERS

Jack Dickstein, Huntingdon Valley, Pa., assignor to Haven Industries, Inc., Worcester, Mass.

Filed May 23, 1975, Ser. No. 580,526

Int. Cl.[2] C07C *69/54*

U.S. Cl. 560—224 **5 Claims**

1. Esters of acrylic, methacrylic or crotonic acid with C_8–C_{20} alkyl phenoxy (ethyleneoxy) ethyl alcohols.

4,075,412

PROCESSES FOR PREPARATION OF DIACYLOXY OLEFINS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 21, 1976, Ser. No. 678,856

Int. Cl.[2] C07C *67/05*

U.S. Cl. 560—244 **8 Claims**

1. In a process for the production of unsaturated diesters which comprises reacting under reaction conditions a conjugated diolefin with a carboxylic acid by contacting a mixture of said diolefin and said acid with free oxygen wherein the improvements comprises using a catalytic amount of a catalyst system consisting essentially of an indium compound selected from the group consisting of indium acetate, indium acetylacetonate, indium hydroxide, indium monochloride, indium trichloride, indium oxyhydroxide, indium selenide, indium sulfate, indium tribromide, indium triiodide, and indium trioxide, a source of chloride ion, bromide ion or iodide ion or mixture thereof, an alkali metal compound and, optionally, a dihalobutene catalyst adjuvant, wherein the halide moiety of said adjuvant is chloride, bromide or iodide.

4,075,413

PROCESS FOR PREPARATION OF DIACETOXYBUTENE

Yasuo Tanabe, Kurashiki, Japan, assignor to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed June 10, 1976, Ser. No. 694,534

Claims priority, application Japan, June 17, 1975, 50-73566; Oct. 23, 1975, 50-127776

Int. Cl.[2] C07C *67/05*

U.S. Cl. 560—244 7 Claims

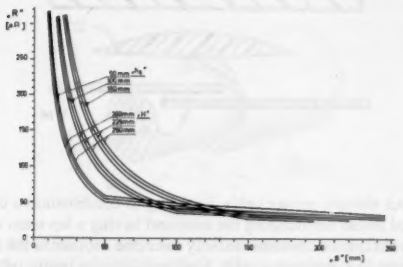
1. In a process for the preparation of diacetoxybutene by a catalytic reaction of butadiene, acetic acid and oxygen or an oxygen-containing gas in the presence of a catalyst containing palladium metal on a support, the improvement which comprises carrying out the reaction by using butadiene containing vinylcyclohexene in an amount of 1 to 5,000 parts by weight per million parts by weight of butadiene and at least one polymerization inhibitor selected from the group consisting of quinone, hydroquinone, 2,5-di-t-butyl-hydroquinone, 2,5-di-t-amylhydroquinone, anthraquinone, phenol, t-butylcatechol, 2,6-di-t-butylphenol, 2,4-di-t-butylphenol, 2,4-di-t-butyl-p-cresol, 4,4′-butylidene-bis (3-methyl-6-t-butylphenol), 2,2-methylene-bis (4-methyl-6-t-butylphenol), and elemental sulfur, the amount of the polymerization inhibitor other than elemental sulfur being from 5 to 50 parts by weight per million parts by weight of butadiene and the amount of elemental sulfur being from 10 to 7,000 parts by weight per million parts by weight of said butadiene.

4,075,414

APPARATUS FOR REGULATING THE IMMERSION DEPTH OF ELECTRODES IN ELECTRODE-MELTING FURNACES

Friedrich Werner Thomas, Niedermittlau, Germany, assignor to Leybold-Heraeus GmbH & Co. KG, Cologne, Germany

Filed Nov. 26, 1975, Ser. No. 635,462
Claims priority, application Germany, Nov. 29, 1974, 2456512
Int. Cl.[2] F27D *11/06*
U.S. Cl. 13—13 2 Claims



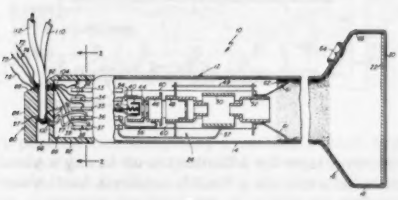
1. Apparatus for the continuous and automatic regulation of the depth of immersion of a driven remelting electrode in the slag layer of an electroslag remelting furnace, comprising regulating means for maintaining the depth of immersion essentially constant at a predetermined value, including first circuit means for detecting the actual resistance of the current-path through the slag layer and for producing a first signal corresponding to the actual resistance, and second circuit means for detecting the changing of the resistance upon the spatial displacement of the electrode within the slag layer and for producing a second signal defining a correction signal corresponding to the changing of the resistance and means receptive of the first signal corresponding to the actual resistance from the said first circuit means and the second signal from the second circuit means for algebraically summing the two and responsive to the sum for controlling the driving of remelting electrode to effect immersion thereof to a depth wherein the said second signal corresponding to the changing of the resistance is essentially constant whereby the electrode is remelted to form a solid ingot beneath the slag.

4,075,415

TUBE WITH TERMINAL END CAP

Warren C. Davis, Cohasset, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 6, 1977, Ser. No. 757,408
Int. Cl.[2] H01R *13/58*
U.S. Cl. 174—50.52 10 Claims



1. The combination comprising:

an electron tube including an evacuated envelope, and at least one terminal pin extending externally of the envelope;

a dielectric cap including a cylindrical wall encircling the pin and a transversely disposed wall having therein at least one pair of substantially mutually perpendicular openings;

a first wire attached directly to the terminal pin and extending through one of the openings in the transversely disposed wall; and

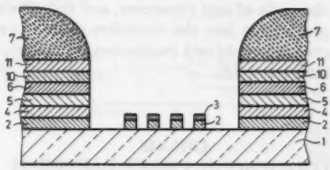
a second wire attached to the first wire and extending through the other opening in the transversely disposed wall.

4,075,416

ELECTRONIC THIN FILM CIRCUIT UNIT AND METHOD OF MAKING THE SAME

Klaus Küttner, Stuttgart; Günter Krüger, Leonberg, and Fedor Modic, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 27, 1976, Ser. No. 652,728
Claims priority, application Germany, Mar. 7, 1975, 2509912
Int. Cl.[2] H05K *1/00*
U.S. Cl. 174—68.5 7 Claims



1. In a thin film electronic circuit unit comprising a substrate plate of insulating material, a patterned layer of a valve metal partly covering the substrate plate in accordance with a first and a second pattern, said first and second patterns being contiguous to each other in at least one location and respectively defining a first and a second portion of said valve metal layer, said first portion providing circuit elements and said second portion providing connecting conductors and areas for external contact and being provided with metallization, said metallization of said second valve metal layer portion including a first copper layer (**4**) on top of said valve metal layer, an intermediate layer (**5**) of a diffusion barrier metal on top of said first copper layer and a second copper layer (**6**) on top of said diffusion barrier metal layer, and a soft solder layer (**7**) provided on top of said metallization, the improvement wherein:

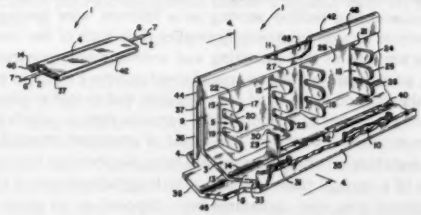
said metallization further comprises five layers (**4**, **5**, **6**, **10**, **11**) of which one is a nickel layer (**10**) located on top of said second copper layer (**6**) and another is a gold layer (**11**) superimposed on said nickel layer (**10**).

4,075,417

CRIMPED, INSULATION PIERCING ELECTRICAL CONNECTION

Dory J. Neale, Sr., St. Petersburg, Fla., assignor to The National Telephone Supply Company, Cleveland, Ohio

Filed Mar. 17, 1976, Ser. No. 667,505
Int. Cl.[2] H01R *5/10*
U.S. Cl. 174—84 C 10 Claims



1. An electrical connection of conductors having insulation thereon comprising:

(a) a generally channel-shaped connector having a web with opposed, spaced apart side walls extending therefrom;
(b) said connector including an electrically conductive inner portion bonded to an electrically insulative outer portion;
(c) said connector inner and outer portions respectively including end portions, a web, and side walls having free longitudinal edges and transverse end edges;
(d) rows of conductor engaging protuberances on the inner portion side walls being disposed transversely thereof; each of said rows having a plurality of said protuberances with a spacing between adjacent protuberance edges for receiving one of said conductors therebetween;
(e) said spacing being smaller than the width of a conductor and being graduated such that the spacing gradationally decreases in width from the rows adjacent said connector ends to the rows intermediate of said connector; and
(f) said conductors having portions thereof clamped between the walls of said connector, and said protuberance edges penetrating into the insulation of said conductors therebetween to hold said conductors and to make electrical contact therewith.

4,075,418

STEREOPHONIC PICKUP CARTRIDGE

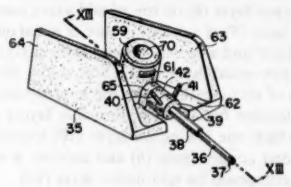
Mitsuo Nemoto, Machida, and Kimiyasu Honma, Kokubunji, both of Japan, assignors to Kabushiki Kaisha Audio-Technica, Machida, Japan

Continuation-in-part of Ser. No. 368,762, June 11, 1973, abandoned, which is a division of Ser. No. 849,767, Aug. 13, 1969, Pat. No. 3,761,647. This application May 23, 1975, Ser. No. 580,159

Claims priority, application Japan, Aug. 14, 1968, 43-57408; Feb. 3, 1969, 44-7290

Int. Cl.² H04R 11/12

U.S. Cl. 179—100.41 K **13 Claims**



1. In a stylus assembly for incorporation in a cartridge destined for mounting on a tone arm of a record player, a stylus sub-assembly comprising an elongate integral synthetic resin moulded composite structure having a longitudinal axis and being constituted of (a) a mounting member, (b) an armature securing member axially spaced from said mounting member and (c) an interconnecting section between adjacent facing ends of said mounting and armature securing members and connect thereto at substantially central regions thereof, said interconnecting section serving as a fulcrum wire having a transverse section substantially smaller than each of the transverse sections of said mounting and armature securing members, an elongate cantilever arm adapted to have a stylus at one end thereof and being fixed at its opposite end to said armature securing member at a side thereof opposite that to which the fulcrum wire is connected, and a pair of armatures secured to said armature securing member and being disposed on opposite sides of a vertical plane including the longitudinal axis of said cantilever arm, said armatures beig disposed at an angle of inclination of 45° relative to said axis and being disposed at right angles to each other, said mounting member, armature securing member and intermediate interconnecting fulcrum wire comprising a single unitary component.

4,075,419

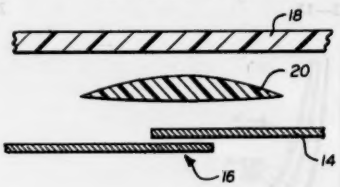
BRIDGING TAPE OVER LAP SEAM CABLE SHIELD

Kenneth J. Virkus, Englishtown, N.J., assignor to General Cable Corporation, Boonton, N.J.

Filed Dec. 20, 1976, Ser. No. 752,172

Int. Cl.² H01B 7/18

U.S. Cl. 174—107 **13 Claims**



1. An electric power cable including in combination a core, a metal shield surrounding the core and having a lap seam with edges that move circumferentially over one another as the core expands and contracts with load cycling, an outer plastic jacket surrounding the metal shield, and a longitudinally extending bridging element having a mid portion that extends across the edge of the outer lap of the seam of the metal shield and circumferentially beyond said edge for distributing the increase in circumference of the metal shield over a greater axial extent of the inside surface of the jacket, the bridging element tapering from its mid portion to thin edges along both of its longitudinal edge portions to avoid abrupt change of displacement of the jacket at the edges of the bridging element.

4,075,420

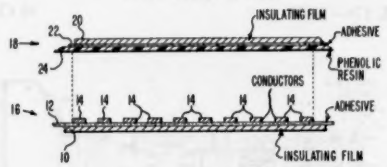
COVER LAYER FOR FLEXIBLE CIRCUITS

Tommy L. Walton, Carlsbad, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 28, 1975, Ser. No. 608,457

Int. Cl.² H01B 7/08

U.S. Cl. 174—117 F **7 Claims**



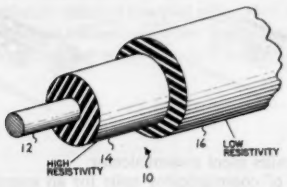
1. A cover layer for a flexible circuit having a plurality of spaced conductors on a flexible substrate, said cover layer comprising:
an outer layer of an insulating polyimide film;
an intermediate layer of a thermosetting adhesive bonded to said outer layer; and
an inner layer of a phenolic resin adhesive bonded to said intermediate layer, wherein said cover layer can be subsequently bonded to the flexible substrate with said inner layer being contiguous with said conductors to provide increased flexibility and protection for the flexible circuit.

4,075,421

DIRECT CURRENT CABLE WITH RESISTIVITY GRADED INSULATION, AND A METHOD OF TRANSMITTING DIRECT CURRENT ELECTRICAL ENERGY

Charles R. McCullough, Scotia, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Dec. 23, 1975, Ser. No. 643,959
Int. Cl.[2] H01B 7/02
U.S. Cl. 174—120 SC 12 Claims



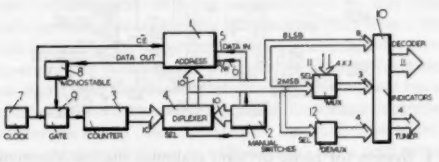
1. An electrical cable for the transmission of high voltage direct current electrical energy which minimizes disproportional direct current induced electrical stresses through the insulation due to temperature changes comprising an elongated metal electrical conductor enclosed within a resistivity graded, composite body of polymeric dielectric insulation, said composite dielectric insulation comprising the combination of an inner layer of polymeric insulation of relatively high resistivity and a contiguous outer layer of filled polymeric insulation of relatively low resistivity, the inner layer of the polymeric insulation comprising a polymeric material consisting essentially of cross-linked polyethylene and the outer layer of the filled polymeric insulation consisting essentially of cross-linked ethylene-containing polymer selected from the group consisting of polyethylene and copolymers of ethylene and propylene containing about 25 to about 150 parts by weight of at least one filler selected from the group consisting of clay and titanium dioxide per 100 parts by weight of the ethylene-containing polymer.

4,075,422

AUTOMATIC PAGE SELECTORS

Henry Louis Baker, Northwood, England, assignor to Communications Patents Limited, London, England

Filed June 17, 1976, Ser. No. 697,027
Claims priority, application United Kingdom, June 21, 1975, 26480/75
Int. Cl.[2] G06F 3/14
U.S. Cl. 178—23 R 5 Claims



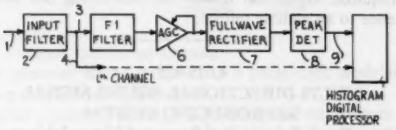
1. A page selector comprising a counter, a page selector device responsive to the output of the counter to select pages for decoding and display, a clock for providing pulses to the counter, a memory the locations of which are sequentially addressable by the counter, means for writing data into the memory, means for controlling the intervals between successive clock pulses applied to the counter in accordance with the written data, manual switches for addressing selected locations of the memory, means for writing information in the selected locations wherein the counter output is connected permanently to the memory and is connected to receive inputs from the manual switches, and wherein the counter comprises first, second and third counter elements and the manual switches comprise first and second switches connected respectively to the first and second counter elements and to separate inputs of a first diplexer, a second diplexer being connected to apply the output of a third switch or the output of the first diplexer to a magazine selector device, and a gate being connected to apply the clock pulses to the first counter element.

4,075,423

SOUND ANALYZING APPARATUS

Michael Joseph Martin, Stevenage, and Michael John Underwood, Letchworth, both of England, assignors to International Computers Limited, London, England

Filed Apr. 14, 1977, Ser. No. 787,448
Claims priority, application United Kingdom, Apr. 30, 1976, 17614/76
Int. Cl.[2] G10L 1/00
U.S. Cl. 179—1 SC 9 Claims



1. Sound analysing apparatus for the evaluation of speech including means for extracting from an applied speech signal a required formant waveform; means for identifying frequency components of the required formant in the waveform; a first store having a plurality of addressable storage locations each associated respectively with a different predetermined range of frequencies; means for adding during each of a succession of predetermined histogram sampling periods of value of unity for each frequency component identified into that one of the storage locations corresponding to the range in which lies the frequency of the identified component and means for producing over a histogram evaluation period comprising a plurality of sampling periods a histogram representation including means for scanning the storage locations in order, to produce for each successive sampling period a progressive total of the values added into the storage locations during a preceding predetermined number of sampling periods; means for deriving an indication that a predetermined fraction of the total has been at least equalled and means for registering an address representing the frequency range included in location currently being scanned at the time when the indication occurs.

4,075,424

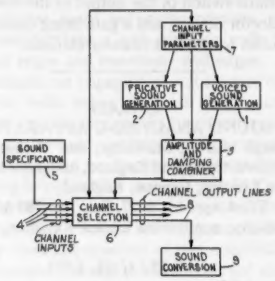
SPEECH SYNTHESIZING APPARATUS

Michael John Underwood, Hitchin; Michael Joseph Martin, Stevenage, and Michael Victor Iles, Loughton, all of England, assignors to International Computers Limited, London, England

Filed Dec. 13, 1976, Ser. No. 749,768
Claims priority, application United Kingdom, Dec. 19, 1975, 52016/75
Int. Cl.[2] G10L 1/00
U.S. Cl. 179—1 SG 7 Claims

1. Speech synthesizing apparatus including means for producing a waveform representative of a voiced sound component comprising means for deriving separately for each of a plurality of formant waveforms respectively a sequence of digital values representing respectively successive instantaneous amplitudes of the formant waveform concerned taken at sampling instants occurring at a predetermined substantially constant frequency; and combining means operable for each sampling instant to combine at that instant the values derived for each of the formant waveforms to produce a resultant sequence of sum values representative of the voiced compo-

nent; the apparatus further including means for modifying the sum value sequence according to the character and damping of



the required sound and means for converting the modified sequence to an audible output.

4,075,425

MULTI-DIRECTIONAL SOUND SIGNAL REPRODUCING SYSTEM

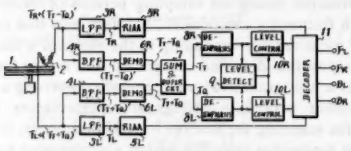
Yoshihisa Kamo; Takeshi Tachibana, and Masao Ichimura, all of Kawasaki, Japan, assignors to Nippon Columbia Kabushikikaisha, Tokyo, Japan

Filed Sept. 19, 1975, Ser. No. 614,873

Claims priority, application Japan, Sept. 24, 1974, 49-109715; Sept. 25, 1974, 49-115345[U]

Int. Cl.² H04R *5/00*

U.S. Cl. 179—1 GQ **12 Claims**



1. A multi-directional stereophonic sound reproducing apparatus for reproducing a multiplex signal of a plurality of stereophonic source signals, said multiplex signal including a first signal component T_Σ, a second signal component T_Δ, a third signal component T_T and a fourth signal component T_Q, wherein:

T_Σ is the sum of the stereophonic source signal

t_Δ is the difference of the stereophonic source signals

T_T is the first demodulated sub-channel information signal

T_Q is a second demodulated sub-channel information signal and, in which $(T_\Sigma + T_\Delta)$ is a first main signal T_R, $(T_\Sigma - T_\Delta)$ is a second main signal T_L, a carrier signal is angle-modulated with sub-signals $(T_T + T_Q)$, and said angle-modulated carrier signal is multi-imposed on said main signal, comprising:

(a) level detecting means comprising a circuit for slicing the T_T signal at a first working level and for wave shaping said sliced signal, a circuit for slicing the T_T signal at a second working level which is different from said first working level and for wave shaping said second sliced signal, and a circuit for transmitting waveforms at rising-up portions of said first and second wave shaped outputs to a flip-flop circuit and for applying outputs of said flip-flop circuit to a master-slave type JK flip-flop circuit at its terminals J and K, whereby a clock pulse produced at a falling-down portion of the waveform obtained by said circuit for wave shaping established to the first working level is applied to a clock terminal of said master-slave type JK flip-flop circuit so as to quickly respond to abrupt variation of the alternating input signal, and

(b) level controlling means provided with an output signal of said level detecting means for controlling the level of said T_T and T_Q to reduce reproduction noise.

4,075,426

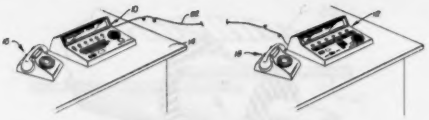
PARALLEL SILENT COMMUNICATOR

Harvey Mitchell Gould, 270 High St., Clinton, Mass. 01510

Filed Mar. 12, 1976, Ser. No. 666,261

Int. Cl.² H04M *11/08*

U.S. Cl. 179—1 H **4 Claims**



1. In a parallel silent communicator:

(a) a pair of communicator units for an executive station console and an operator station console;

(b) said unit for said executive station having a screen for silent visual display of alphanumeric information as well as a set of individual switch elements corresponding to coded limited language messages;

(c) said unit for said operator station having a keyboard for composing silent unlimited language alphanumeric messages as well as a set of individual indicators corresponding to said switch elements;

(d) a communication link between said units;

(e) logic units for converting said alphanumeric messages to a visual display at said executive station; and

(f) means for switching said indicators to an "ON" state by operation of the corresponding switch element at the executive station.

4,075,427

SYSTEM FOR PHASE DIVISION MULTIPLEX DUPLEX COMMUNICATION OVER A TWO-WIRE CIRCUIT BETWEEN A MASTER TERMINAL AND A SLAVE TERMINAL

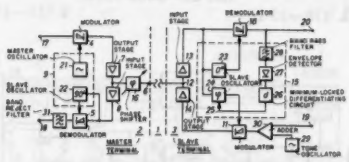
Örjan Mats Mattsson, Farsta, and Walter Herbert Erwin Widl, Bandhagen, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Nov. 15, 1976, Ser. No. 741,567

Claims priority, application Sweden, Dec. 2, 1975, 7513605

Int. Cl.² H04J *11/00*; H04L *5/14*

U.S. Cl. 179—15 BC **5 Claims**



1. System for phase division multiplex duplex communication over a two-wire circuit comprising: a master terminal and a slave terminal; said master terminal comprising a first modulator and a first demodulator jointly connected to a first end of the two-wire circuit, the first modulator being arranged to transmit an outgoing AM-signal with an essentially non-suppressed carrier forming a pilot signal and the first demodulator being arranged to receive an incoming AM-signal with a considerably suppressed carrier component having a frequency identical to the frequency of the pilot signal, a first oscillator circuit being arranged to supply the first modulator and the first demodulator with a first and a second, respectively, oscillator signal having a frequency identical to the frequency of the pilot signal and with a deviation from a phase relationship of 90° equal to the absolute value of the total phase shift in the

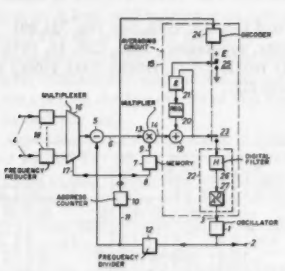
transmission path from the first modulator to the first demodulator via the first end of the two-wire circuit; and the slave terminal comprising a second demodulator and a second modulator jointly connected to a second end of the two-wire circuit and arranged to receive the AM-signal with the pilot signal to transmit, respectively, the AM-signal with the suppressed carrier component, a second oscillator circuit being arranged to supply the second demodulator and the second modulator with a third and fourth, respectively, oscillator signals of a frequency identical to the frequency of the pilot signal and with a deviation from a phase relationship of 90° equal to the absolute value of the total phase shift in the transmission path from the second modulator to the second demodulator via the second end of the two-wire circuit.

4,075,428

DEVICE FOR PROVIDING PHASE SYNCHRONISM OF A TRANSIT STATION IN A DIGITAL TELECOMMUNICATION NETWORK

Walter Ghisler, Upplands-Vasby; Aleksander Marlevi, Saltsjo-Boo, and Johan Olof Anäs, Huddinge, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Mar. 28, 1977, Ser. No. 782,043
Claims priority, application Sweden, Apr. 27, 1976, 7604797
Int. Cl.[2] H04J *3/06*
U.S. Cl. 179—15 BS 1 Claim



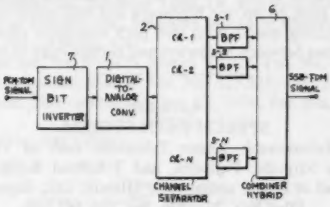
1. Device for providing phase synchronism of a transit station in a digital telecommunication network, comprising within a phase-locked loop a voltage-controlled oscillator that has an output arranged to supply a station clock signal and a control input capable of being actuated upon by line clock signals pertaining to a plurality of incoming lines from other transit stations in the telecommunication network and a phase comparator that is arranged to compare the phase of the station clock signal with the phases of the line clock signals and has an output connected to the control input of the voltage controlled oscillator via a loop filter, wherein the loop filter comprises a memory means which has an address input and a read output and is arranged to store selected weighting coefficients for the line clock signals, an address counter means which has an input connected to the output of the voltage-controlled oscillator and an output arranged for a cyclical read out of address words allotted to said incoming lines and connected to the address input of the memory means, and a multiplier means which has a first input connected to the output of the phase comparator, a second input connected to the read output of the memory means and an output connected to the control input of the voltage-controlled oscillator via an averaging means, a time multiplexor stage being connected between said incoming lines and the phase comparator and having an address input connected to the output of the address counter means.

4,075,429

TRANSMULTIPLEXER

Fumio Takahata; Kazunori Inagaki, and Yasuo Hirata, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Apr. 20, 1976, Ser. No. 678,686
Claims priority, application Japan, Apr. 21, 1975, 50-48509; May 6, 1975, 50-54410
Int. Cl.[2] H04J *1/00*
U.S. Cl. 179—15 BM 4 Claims



1. A transmultiplexer comprising:

input terminal means receptive of a pulse-code-modulated, time-division multiplex signal,

a sign bit inverter connected to said input terminal means for reversing sign bits of predetermined specific channels in the pulse-code-modulated, time-division multiplex signal,

a digital-to-analog converter connected to the output of said sign bit converter,

a channel separator connected to the output of said digital-to-analog converter for branching the output signal of said digital-to-analog converter into a plurality of separated signals,

a plurality of band-pass filters connected to said channel separator for providing respective channel signals of a single-side-band frequency-divided multiplex signal, said

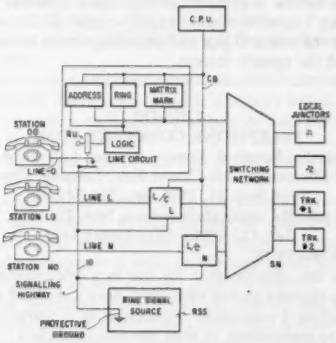
a combiner hybrid connected to said band-pass filters to obtain said single-side-band frequency-divided multiplex signal.

4,075,430

LINE SIGNALLING OVER COMMON HIGHWAY FOR TELECOMMUNICATIONS SYSTEM

Jose Reines, Glen Ellyn, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 14, 1976, Ser. No. 686,303
Int. Cl.[2] H04M *3/02*
U.S. Cl. 179—18 J 4 Claims



1. A telephone system having a group of lines with each line directed to one or more stations, a line circuit individual to each line, a switching network, a common control for completing calls through the network to line circuits of calling and called lines, a two-conductor multiplex signaling highway

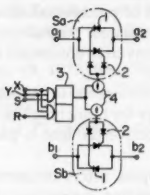
connected in multiple to the line circuits of said group, a plurality of signaling sources each generative of signals of a different type, each signaling source having a path to provide access to the signaling highway, switching means at each said path selectively operative to couple the respective source and its path to the highway, switching means in each line circuit selectively operative to connect the coupled signaling source to the multiplex signaling highway for transmission of signals from the coupled source to any line circuits in which said line circuit switching means are operative, and in which there are further groups of line circuits with a signaling highway individual to each group, the highways and said paths comprising an intersecting matrix with said path switching means at the intersections between highways and certain ones of said paths.

4,075,431

SPEECH PATH SYSTEM

Takuji Mukaemachi; Tetsuo Takeshita, both of Yokohama; Tatsuru Miyoshi, Fujisawa, and Takafumi Kojima, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 26, 1976, Ser. No. 661,660
Claims priority, application Japan, Feb. 28, 1975, 50-24015
Int. Cl.[2] H04M *7/06;* H04Q *3/00*
U.S. Cl. 179—18 GF **8 Claims**



1. A speech path system comprising:

a speech path network including a pair of line terminals and a pair of trunk terminals and having switching elements comprising semiconductors having at least four layers arranged at crosspoints for making or breaking the connections between said line terminal pair and said trunk terminal pair, and switch control means, each switch control means comprising a drive circuit for driving the individual semiconductor switching element and a memory circuit for storing the operating state of said drive circuit;

a subscriber line circuit for connecting said line terminal pair directly to a subscriber line; and

a trunk circuit connected to said trunk terminal pair and having a speech current supply circuit D.C. coupled to the trunk terminal pair and including means for turning on or off the speech current.

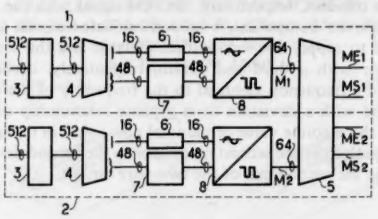
4,075,432

TELEPHONE CONCENTRATOR

Yves Renaudin, Bougival, France, assignor to Societe Lannionnaise d'Electronique Sle-Citerel S.A., Lannion, France

Filed Nov. 11, 1976, Ser. No. 741,080
Claims priority, application France, Nov. 21, 1975, 75 35686
Int. Cl.[2] H04J *3/00;* H04Q *3/60*
U.S. Cl. 179—18 FC **6 Claims**

1. In a line concentrator for use in a telecommunications system to connect analog subscriber lines to a PCM exchange and including a successive connection of a plurality of subscriber line equipments, at least one spaceswitched concentration network, junctors, and coder/decoders for analog/digital and digital/analog conversion, the improvements characterized by: said junctors comprising at least two different types including a "simplified" type capable of transmitting conversation but incapable of setting up a call and a "complete" type which is also capable of setting up a call, the concentrator including control means for selecting a complete junctor during the setting up of a call through the concentrator and for switching said call through a simplified junctor once the call is established, the coder/decoders being followed in the successive connection by a time-switched connection network for changing the multiplex time channel of said call in response to the change of junctors so that the same multiplex time channel is used throughout a call both before and after switching of the junctor.

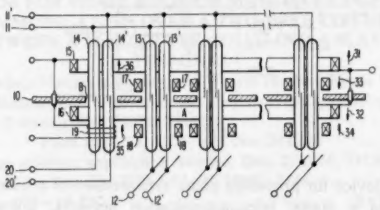


4,075,433

SIGNAL SWITCHING DEVICE

Sadayuki Mitsuhashi; Norio Suzuki, and Kazuyoshi Nago, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 13, 1976, Ser. No. 731,961
Claims priority, application Japan, Oct. 14, 1975, 50-123921
Int. Cl.[2] H01H *67/14;* H04M *1/00;* H04Q *3/00*
U.S. Cl. 179—18 GE **5 Claims**



1. A signal switching device comprising:

a magnetic shunt plate having a first set of through apertures arranged in crossing rows and columns and a second set of through apertures formed in a column adjacent to said first set of through apertures;

electromagnetic switching elements inserted into the respective through apertures in the first and second sets through apertures so as to extend through the magnetic shunt plate;

first and second coil means associated with each row arranged on the opposite faces of said magnetic shunt plate in the direction of the rows of said through apertures for excitation of said electromagnetic switching elements inserted in said first and second sets of through apertures;

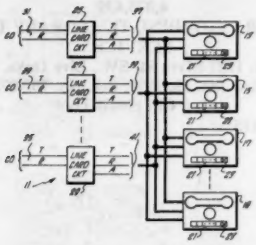
third and fourth coil means associated with each column arranged on the opposite faces of said magnetic shunt plate in the direction of the columns of said first set of through apertures for excitation of said electromagnetic switching elements inserted in said first set of through apertures; and

fifth coil means for exciting said electromagnetic switching elements inserted in said second set of through apertures.

4,075,434
KEY TELEPHONE PRIVACY EXCLUSION APPARATUS

George Albert Merritt, Jr., Irvine, Calif., assignor to San/Bar Corporation, Santa Ana, Calif.

Filed Mar. 25, 1976, Ser. No. 670,415
Int. Cl.[2] H04M *1/68*
U.S. Cl. 179—99 10 Claims



1. In key set subscriber systems wherein a plurality of central office lines go to a plurality of key sets through respective line card circuits which supply respective A leads to each of said key sets, each key set having a line button for each central office line and A lead terminating thereat and one hold button, privacy exclusion apparatus for at least two key sets in said system, said privacy exclusion apparatus comprising:

at a first key set;

means responsive to said first key set being off-hook and connected to a central office line, for sensing a voltage level on its A lead, said voltage level indicating whether a second key set is utilizing said line;

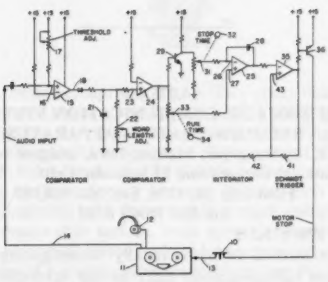
means responsive to said sensing means detecting a voltage level indicative of said second key set utilizing said line, for opening the line circuit of said first key set; and at a second key set;

means responsive to a momentary hold button depression at said second key set for providing a voltage level on the A lead of said first key set, said voltage level indicating that said second key set is not utilizing said line.

4,075,435
METHOD AND APPARATUS FOR AUTOMATIC DICTATION PLAYBACK CONTROL

William G. Eppler, Jr., Westport, Conn., assignor to The VSC Company, Westport, Conn.

Filed Jan. 30, 1976, Ser. No. 654,026
Int. Cl.[2] G11B *15/18*
U.S. Cl. 179—100.1 VC 3 Claims



3. The method of reproducing a continuous speech recording for substantially continuous transcribing comprising the steps of:

operating the record reproducer to obtain the signal recorded on a record medium;

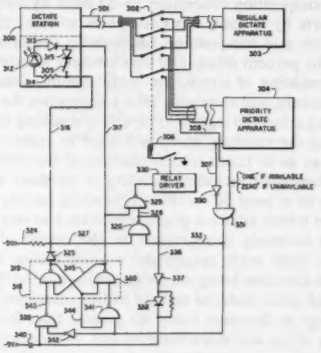
analyzing said signal for word content by detecting word presence and word absence; and

controlling operation of said reproducer so as to allow a substantially constant rate of transcription of word content by counting said word presence minus said word absence.

4,075,436
CASSETTE CENTRAL DICTATION SYSTEM

Fred C. Bolick, Jr.; Theodore Titus, IV, and Said Mohammadioun, all of Atlanta, Ga., assignors to Lanier Electronic Laboratory, Inc., Atlanta, Ga.

Division of Ser. No. 554,476, March 3, 1975, Pat. No. 4,024,354, which is a continuation of Ser. No. 327,501, Jan. 29, 1973, abandoned. This application Dec. 22, 1976, Ser. No. 753,359
Int. Cl.[2] H04M *11/10*
U.S. Cl. 179—100.1 DR 6 Claims



1. Message recording apparatus for selectively recording either regular or priority messages, comprising:

message dictate station;

regular message recording means selectively operable for seizure and subsequent recording of dictated messages from said dictate station;

priority message recording means, including substitution means carrying a plurality of discrete recording members for substituting a second discrete recording member for a first discrete recording member in recording interrelationship with said priority message recording means, said priority message recording means being selectively operable for seizure, subsequent recording of dictated messages from said dictate station, and substitution of said second discrete recording member for said first discrete recording member;

control switch means associated with said dictate station and selectively operative to provide a priority signal condition corresponding to desired selection of said priority message recording means;

switching means operatively interconnected to control circuit means;

said control circuit means being operatively interconnected with said control switch means for generating a first switching signal condition in the absence of said priority signal condition or a second switching signal condition in the presence of said priority signal condition;

said first switching signal condition causing said switching means to assume a first state placing said dictate station in operative relation only with said regular message recording means;

said second switching signal condition causing said switching means to assume a second state placing said dictate station in operative relation only with said priority message recording means; and

said control circuit means being operative in response to

termination of seizure of said priority message recording means to restore said first switching signal condition, thereby causing said switching means to reassume said first state placing said dictate station in operative relation only with said regular message recording means.

4,075,437

COMPOSITION, PROCESSING AND DEVICES INCLUDING MAGNETIC ALLOY

Gilbert Yukyu Chin; John Travis Plewes, both of Berkeley Heights, and Bud Caesar Wonsiewicz, Summit, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 16, 1976, Ser. No. 705,994
Int. Cl.[2] H04R *13/02*; C22C *38/18*; C21D *1/04*
U.S. Cl. 179—114 R **22 Claims**

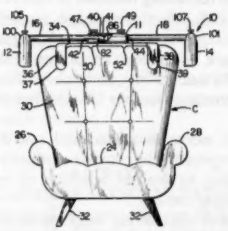
1. Method for producing a magnetic element which comprises mechanically working stock material comprising the ternary composition chromium 25–30 parts by weight, cobalt 10–20 parts by weight, remainder iron to total 100 parts by weight, the said composition additionally comprising at least 0.1 weight percent of at least one element selected from the group consisting of zirconium, molybdenum, vanadium, niobium, titanium, and aluminum which comprises the steps of (a) hot rolling a formed ingot, (b) rapidly quenching the ingot, (c) subjecting the resultant quenched ingot to room temperature forming so as to result in deformation of the stock material, such deformation including bending to produce a change in direction of at least 30° with such bending having a radius of curvature which attains a magnitude at least as small as a value which is inversely proportional to the extent of change in direction with such magnitude corresponding with a 30° change in direction being no greater than equal to the thickness of the said stock material and the radius corresponding with a 90° change in direction being no greater than four times the thickness of the said stock material and, (d) magnetically aging the formed product to develop desired magnetic characteristics.

4,075,438

STEREO SPEAKER SYSTEM

Gary Kappel, 1630 Centennial Drive, Longmont, Colo. 80501

Filed Dec. 2, 1976, Ser. No. 746,842
Int. Cl.[2] H04M *1/04*
U.S. Cl. 179—146 H **16 Claims**



1. A portable speaker apparatus adapted for attachment to a chair having a backrest portion thereon, comprising:

a speaker housing having a speaker mounted therein;

a mounting bracket including front and rear gripping means having a space therebetween for receiving the backrest portion for removably attaching said mounting bracket to the backrest of the chair, said mounting bracket also including adjustment means for adjusting the space between said front and rear gripping means according to the thickness of the backrest portion of the particular chair on which the speaker apparatus is being attached; and

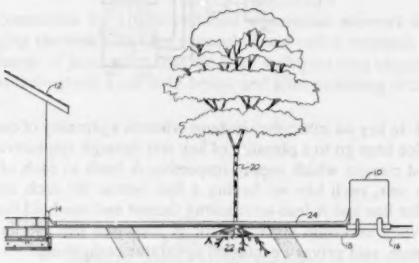
a support arm connected on one end to said speaker housing and connected on its opposite end to said mounting bracket, said support arm being operative to support said speaker housing in a position forward from the backrest of the chair near the space occupied by a person's head when he is sitting in the chair.

4,075,439

METHOD FOR PROVIDING TEMPORARY TELEPHONE SERVICE

Jack V. Smiley, 1307 Myra St. SW., Live Oaks, Fla. 32060

Filed Jan. 13, 1977, Ser. No. 759,073
Int. Cl.[2] H04B *3/46*
U.S. Cl. 179—175 **7 Claims**



1. A method for reinstating or establishing telephone service between a telephone central office and a subscriber to be connected to said central office by a permanent cable, comprising the steps of:

providing a low tensile strength cable having a tensile strength substantially less than 60 pounds such that such cable may be easily broken by a person inadvertently walking therethrough, said cable comprised of insulating material having a spaced pair of low tensile strength conductors therein;

stringing said cable along the ground between said subscriber's terminal and an uninterrupted connection to the central office;

coupling said conductors at one end of said cable to said subscriber's telephone terminal;

coupling said conductors at the other end of said cable to said uninterrupted connections; whereby

said low tensile strength cable provides a temporary, low injury risk, above ground conductor until repair or installation of a permanent aerial or underground cable is completed.

4,075,440

AUTOMATIC COMMUNICATION SYSTEM RECONFIGURATION APPARATUS

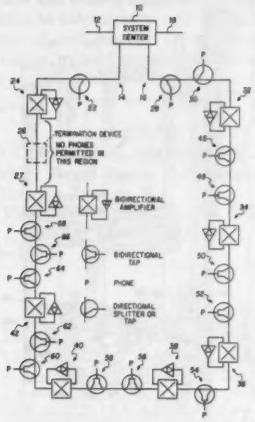
William C. Laubengayer, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed July 26, 1976, Ser. No. 708,962
Int. Cl.[2] H04B *3/46*
U.S. Cl. 179/175.3 S **4 Claims**

3. The method of automatically reconfiguring a pair of terminated communication links having reversible transmission capability, where the terminated sections are in close proximity, upon a break in one of the links to restore operation to the broken portion by connecting it to the other link comprising, the steps of:

transmitting a carrier through each of the communication links;

detecting the reception of said carrier at the termination section of one of the communications links; and



electrically connecting the terminated sections to pass communication signals therethrough upon failure to detect the reception of said carrier from a given direction.

4,075,441

SLIDE SWITCH HAVING RESILIENT MOVABLE CONTACT ARM TWISTED TO PROVIDE EFFICIENT ELECTRICAL CONNECTION

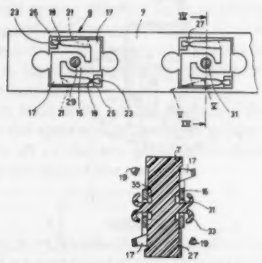
Wilhelmus Johannes Franciscus Rath, and Johannes Martinus Augustinus Henricus van der Donk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 12, 1976, Ser. No. 657,559

Claims priority, application Netherlands, Apr. 7, 1975, 7504084

Int. Cl.[2] H01H *15/06, 1/50*

U.S. Cl. 200—16 D **3 Claims**



1. A slide switch comprising a strip-like contact slide having opposite parallel surfaces, each such surface being provided with at least one movable contact spring, a housing having opposing walls parallel to the plane of the contact slide, said contact slide being longitudinally slidable between said opposing housing walls, stationary contacts on each such housing wall for cooperation with the movable contact springs on the opposing contact-slide surface, each movable contact spring including a pair of elongated resilient legs respectively situated on both sides of a planar central portion serving for the connection of said movable contact spring to the contact slide, said pair of legs being formed as an integral unit from a plate-like material with said central portion, each leg being provided with a contact area adjacent its free end, and each leg being folded outwardly with respect to said central portion along a fold line oblique to the longitudinal direction of said leg so as to twist said leg at an angle with respect to said central portion, and means to movably connect each movable contact spring to the contact slide.

4,075,442

MINIATURE SLIDE SWITCH ASSEMBLY HAVING FLEXIBLE DETENT ON MOVABLE ACTUATOR OR FIXED HOUSING

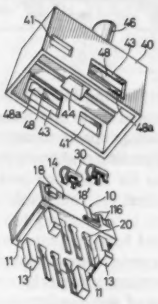
Hiroshi Fukuda, and Tooze Kuzuo, both of Tokyo, Japan, assignors to Matsu Kyu Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 9, 1976, Ser. No. 713,217

Claims priority, application Japan, Feb. 26, 1976, 51-28898

Int. Cl.[2] H01H *15/02, 9/00*

U.S. Cl. 200—16 F **4 Claims**



1. A miniature slide switch assembly comprising:

a. a fixed base member, having a pair of opposite longitudinal side surfaces, molded out of any suitable insulating material, each of said side surface having a pair of recesses,

b. at least two adjacent molded fixed contacts disposed in an array in the longitudinal direction of said base member and molded integrally with said base member, each of said fixed contacts comprising a contact plate having a pair of tapered edges at the lower end thereof and elongated leg portions integral with the top end of said tapered edges, said contact plate being disposed above said base member, said leg portions being disposed extending downwards below said base member,

c. a movable casing member having opposite longitudinal walls and slidably riding on said base member so that it can slide in the direction of the array of said fixed contacts, a cavity at the upper end of said movable casing member in the upwardly extending direction of said fixed contact, a pair of resilient detent bars integral with said side wall of said movable casing member, each of said resilient detent bars having at the top end thereof a finger capable of being snap fitted into said recesses corresponding to the ON-condition and the OFF-condition of the switch assembly, respectively,

d. an electrically conductive strip being inversed U-shaped and being accommodated in said cavity of said movable casing member,

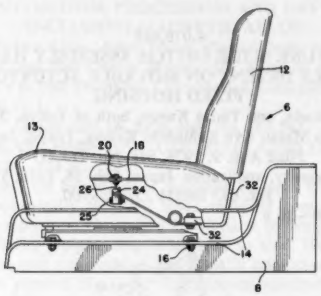
said conductive strip being slidable over said fixed contacts from one of a first and a second position to the other in accordance with the movement of said movable casing member, whereby, when said conductive strip is in the first position, it bridges said adjacent fixed contacts, while when said conductive strip is in the second position, the bridging of said strip between said adjacent fixed contacts is broken.

4,075,443

CUSHION SPRING SAFETY SYSTEM

Richard N. Fatur, Eastlake, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Aug. 11, 1976, Ser. No. 713,467
Int. Cl.[2] B60K *28/00*
U.S. Cl. 200—85 A 6 Claims



1. In a vehicle, a seat having seat frame members, and seat covering material mounted upon said frame members, a vehicle safety system including: spring means mounted upon said frame members for supporting said covering material, pressure activated switch means for rendering said vehicle capable of operation when activated and incapable of operation when deactivated, at least one torsion spring having a free end and a fixed end, said fixed end being mounted upon said seat frame members, said switch means being mounted on said free end so that said at least one torsion spring is located interiorly of said covering material and of the confines of said seat, contact means mounted upon said spring means for engaging said switch means to activated said switch means upon the application of a predetermined force to said covering material and for disengaging said switch means to deactivate said switch means upon the cessation of application of said predetermined force, said contact means including a pair of flat plate members and means attaching said flat plate members to said spring means.

4,075,444

ELECTRICAL CONNECTOR STRUCTURE

Robert Allen Hollingsead, La Habra; Abraham Kuchler, and Clyde Robert Pryor, both of Anaheim, all of Calif., assignors to Hollingsead-Pryor Enterprises, Inc., Santa Fe Springs, Calif.

and a continuation-in-part of Ser. No. 613;348, Sept. 15, 1975, Continuation-in-part of Ser. No. 535,288, Dec. 23, 1974, abandoned. This application Jan. 9, 1976, Ser. No. 647,903
Int. Cl.[2] H01R *33/30*
U.S. Cl. 200—51.09 22 Claims

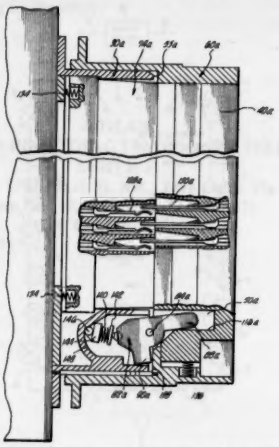
1. For use in an electrical connector racking system which comprises a previously-installed supporting member adapted to be connected to "in place" electrical equipment, and a modular, readily removable member supported on the supporting member and requiring electrical interconnection with said "in place" equipment, an electrical connector comprising:

a first connector shell adapted to be mounted on one of the members;

a second connector shell adapted to be mounted on the other member in alignment with the first connector shell and adapted to mate with said first connector shell;

a first electric-terminal-providing means mounted at least partially within one of the connector shells and carrying a plurality of side-engaging terminals;

a second electric-terminal-providing means movably mounted at least partially within the other connector shell and carrying a plurality of side-engaging terminals disposed to engage the side-engaging terminals of said first means when said second means is moved relative to its connector shell; and



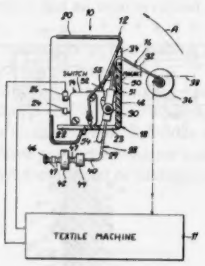
force transmitting means for automatically moving said second means to automatically bring its side-engaging terminals into engagement with the corresponding terminals of said first means.

4,075,445

THREAD MONITORING SWITCH FOR TEXTILE MACHINES HAVING MAGNET BIASING LEVER TO PREVENT ANY ANNOYING THREAD FLUTTER

Gerhard Kempf, Arbon, Switzerland, assignor to Evolution SA, Rorschach, Switzerland

Filed Apr. 14, 1976, Ser. No. 676,667
Claims priority, application Germany, Apr. 15, 1975, 2516488
Int. Cl.[2] B65H *25/14*
U.S. Cl. 200—61.18 10 Claims



1. A device for monitoring the passage of a filament to a machine, comprising:

a fixed support;

a movable member mounted on said support and provided with thread-guiding means thread-guiding means for holding said filament under tension;

stop means on said support defining a normal position for said member;

switch means on said support operable by said member in an off-normal position thereof to arrest said machine upon rupture of said filament;

biasing means tending to displace said member from said normal position to said off-normal position agains the tension of said filament; and

magnetic means disposed in part on said member and in part on said support for exerting upon said member a retaining

force supplementing the tension of said filament in opposing said biasing means, said retaining force being less than the force of said biasing means in said normal position and diminishing to substantially zero within the range of displacement of said member for rapid operation of said switch means by said member in the event of filament rupture.

4,075,446

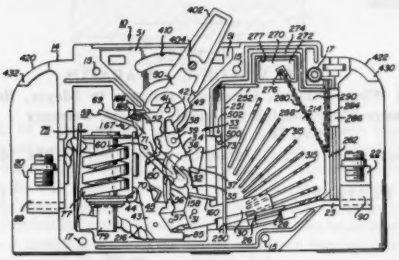
CIRCUIT BREAKER ARC VENTING SCREEN

Frank P. Andahl, Bound Brook, N.J., assignor to Heinemann Electric Company, Trenton, N.J.

Filed July 15, 1976, Ser. No. 705,458

Int. Cl.[2] H01H *33/08*

U.S. Cl. 200—144 R **3 Claims**



1. In a molded case circuit breaker,
a case divided longitudinally into two approximate half cases,
said case enclosing a linkage mechanism including a movable contact and a stationary contact engageable thereby,
each case defining, in part, an arcing chamber,
said half cases each having a side wall, an end wall, and a top wall,
the end walls of each half case defining an opening through which the arc gases are vented,
a unitary two-legged screen having apertures through which said arc gases may flow having one leg thereof positioned within said arcing chamber so as to restrict said opening,
the two legs of said screen diverging from each other so as to define a diverging substantial space which increases in volume in the direction of the opening movement of said movable contact,
whereby at least some of the arc gases flow sequentially through the apertures in both legs of the screen and substantially all of the arc gases flows through said space between the legs of the screen.

4,075,447

DOUBLE-PUFFER-TYPE COMPRESSED-GAS CIRCUIT-INTERRUPTER CONSTRUCTIONS

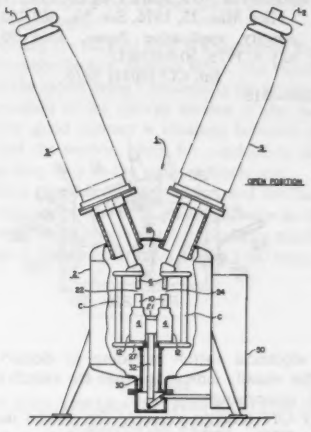
Joseph R. Rostron, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 21, 1975, Ser. No. 560,461

Int. Cl.[2] H01H *33/70*

U.S. Cl. 200—148 A **11 Claims**

1. A double-break type of circuit-interrupter including means defining a pair of spaced stationary contacts, a pair of laterally spaced vertically arranged bottle-type puffer cylinder electrically and mechanically interconnected by a movable yoke structure, a common vertically movable operating rod having one end thereof fixedly secured to said movable yoke structure to cause the simultaneous opening and closing vertical movements of said vertically arranged bottle structures, each vertically arranged bottle structure carrying therewith a movable insulating nozzle and movable contact, the sleeve portion of the vertically movable bottle moving over a fixed piston structure, whereby compression of the gas within the bottle will cause ejection thereof through said nozzle to effect extinction of the arc established between the respective stationary and movable contacts, and a common supporting structure (27) for the two fixed piston structures for the device.



4,075,448

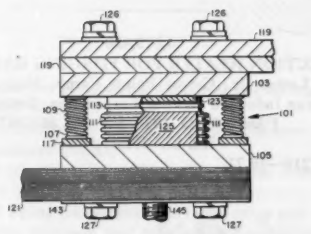
CELL BYPASS SWITCHES FOR ELECTROCHEMICAL CELL SYSTEMS

Jack H. Seedorf, North Tonawanda; Robert M. Hruda, Horseheads, both of N.Y., and Donald E. Abell, Chesterfield, Mo., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Sept. 29, 1975, Ser. No. 617,760

Int. Cl.[2] H01H *1/02, 33/00*

U.S. Cl. 200—262 **21 Claims**



1. In an electrochemical cell circuit having a plurality of electrolytic cells, the improvement comprising a cell by-pass switch having contact surfaces sealed in a corrosive resistant evacuated envelope.

7. The circuit of claim 1 wherein the cell by-pass switch has vacuum circuit interrupters comprising
a. an upper end plate and a lower end plate
b. two contact members of a copper-bismuth alloy, each in mechanical and electrical connection with each end plate, each contact member having a contact surface,
c. a flexible envelope, mechanically connected to the upper and lower end plate and enclosing the contact members, the envelope being constructed of a material which is impermeable to air and the mechanical connection of the envelope to the end plate being such that a vacuum is maintained in the space enclosed by the envelope and the end plates.

4,075,449

SWITCH WITH ELECTROLUMINESCENT INDICATOR

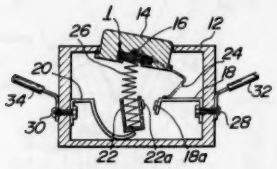
Hideaki Yagi, Kasugai, and Tetsuo Hishiki, Nagoya, both of Japan, assignors to NGK Spark Plug Co. Ltd., Nagoya, Japan

Filed Mar. 23, 1976, Ser. No. 669,733

Claims priority, application Japan, June 30, 1975, 50-91308[U]; July 8, 1975, 50-94938[U]

Int. Cl.² H01H 9/16

U.S. Cl. 200—315 **13 Claims**



1. An electrical switch including an electro-luminescent element for visually indicating when the switch is in its OFF condition, comprising:

an OFF-ON actuator mounted for pivotal movement between OFF and ON positions, switch contacts for connection to an external supply of electricity, and switching means actuatable by said actuator between OFF and ON conditions;

said actuator including an electroluminescent element comprising a ferroelectric sintered ceramic substrate, a luminescent layer applied on one surface of said substrate, a transparent electrode layer applied over the surface of said luminescent layer, and another electrode on the opposite side of said substrate;

said actuator being at least semi-transparent so that light from said luminescent layer may be seen outside of said switch and actuator;

said electroluminescent element being electrically connected in parallel with said switching means so that current will flow through only one of them at any time, said luminescent layer thereby emitting light only when said switch is in its OFF condition.

4,075,450

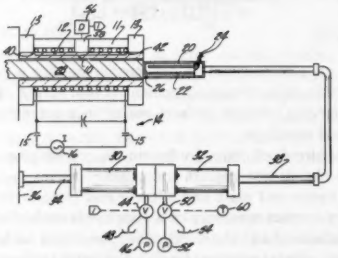
INDUCTION HEATER FOR FORGING BAR STOCK

Paul N. Lavins, Jr., Grosse Pointe Farms, Mich., assignor to American Induction Heating Corporation, Detroit, Mich.

Filed Feb. 23, 1976, Ser. No. 660,067

Int. Cl.² H05B 5/02

U.S. Cl. 219—10.71 **8 Claims**



1. An induction heating system for heating the end of a length of forging bar stock, comprising: an induction heating coil wound about a longitudinal axis; an elongated support for bar stock disposed on the longitudinal axis of the coil so that it extends beyond the coil at both ends; a push rod movable along the longitudinal axis of the coil and having a stop surface to abut one end of a bar retained on said support and inserted into the coil from a first end thereof, said push rod having a travel which extends the stop surface from said first end of the coil, through the coil, and substantially beyond the second end; actuator means for said push rod to move the stop between a first position wherein the stop is external of the coil and beyond the second end of the coil so that the end of a bar inserted into the coil with its end abutting the stop surface has its end extending beyond the coil, a second position wherein the stop surface is adjacent the second end of the heating coil so that a bar inserted into the coil from the first end with its end abutting the stop surface has its end supported within the coil, and a third position wherein the stop surface is adjacent the first end of the coil, whereby motion of the stop member between said second position and said third position pushes the end of the bar out of the coil; and control means for the actuator means operative to control the time that the stop occupies said first position.

4,075,451

BUTT WELDING APPARATUS

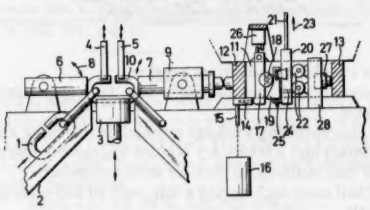
Toni Wüst, Cologne, Germany, assignor to Meyer, Roth & Pastor Maschinenfabrik GmbH, Cologne, Germany

Filed Dec. 1, 1975, Ser. No. 636,584

Claims priority, application Germany, Dec. 4, 1974, 2457180

Int. Cl.² B23K 11/02

U.S. Cl. 219—51 **7 Claims**



1. In an apparatus for the electric butt welding of a workpiece having rod-like ends; the apparatus including a machine frame; at least two welding electrodes; means for bringing the electrodes into contact with the workpiece; two upsetting tools for supporting the workpiece; means for movably supporting at least one of the upsetting tools to be displaceable in the upsetting direction; an upsetting device connected to and actuating the upsetting tools; a control means for controlling the course of motion of the electrodes and the upsetting tools and for controlling the welding current as well as the upsetting device; a force measuring device connected to the movable upsetting tool for sensing the pressing force exerted by the upsetting tool on the workpiece; means for setting a desired value of the pressing force; a switch coupled to the force measuring device to be actuated by the force measuring device when the desired value of the pressing force is reached; and a welding circuit including the switch for effecting the flow of welding current when the desired value of the pressing force is reached; the improvement wherein said means for movably supporting at least one of the upsetting tools includes a sleeve pivotally secured to the machine frame; said movable upsetting tool being slidably supported in said sleeve; a carriage displaceably supported on said machine frame; said control means including a force exerting means for urging said carriage against said movable upsetting tool for imparting a pressing force by said carriage on said movable upsetting tool when the latter is in an operational position; said carriage being connected with said upsetting device; said control means further including a force transmitting means connected to said force exerting means and said force measuring device; said force measuring device being connected to said carriage for applying thereto a force derived from the force exerted by said force exerting means to said force measuring device through said force transmitting means; said force measuring device being

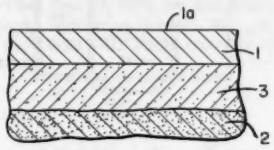
operatively connected to said switch for actuating said switch when the desired value of the pressing force is reached.

4,075,452

ELECTRORESISTOR AND METHOD OF MAKING SAME

Paul René Simon, Nice, France, assignor to Societe Francaise de l'Electro-Resistance, Nice, France

Filed Oct. 7, 1976, Ser. No. 730,690
Claims priority, application France, Aug. 6, 1976, 76 17269
Int. Cl.[2] B23K *15/00*
U.S. Cl. 219—121 EM **12 Claims**



12. In a process for producing a high precision electrical resistance element by the effect of a beam of ions having a known average kinetic energy to produce a determinable etching effect at a target area at which is located a target array comprising an electrically conductive metallic layer secured to an electrically insulating substrate wherein the layer is masked with a masking material to define a pattern having a contour corresponding generally to the electrical resistance element produced and grooves therein; the improvement comprising:

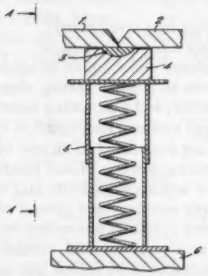
applying to said metallic layer a masking material having an erosion rate greater than the erosion rate of said metallic layer under like conditions of ion bombardment and having a thickness which is a function of the erosion rates of said masking material and said metallic and the thickness of said metallic layer sufficient that, upon ion bombardment, said masking material is completely eroded prior to the complete erosion of said metallic layer in the grooves defined by said masking material.

4,075,453

WELDING

Paul Donald Roberts, 168 Carmel Road North, Darlington, Durham, England

Continuation-in-part of Ser. No. 385,581, Aug. 3, 1973, abandoned. This application Sept. 30, 1974, Ser. No. 511,034
Claims priority, application United Kingdom, Aug. 4, 1972, 36616/72
Int. Cl.[2] B23K *9/02*
U.S. Cl. 219—125.1 **6 Claims**



1. A method of butt welding two steel plates which comprises of steps of:

(1) placing the two steel plates so that their fusion faces are closely adjacent to or abut each other;

(2) placing against one side of the junction of the fusion faces a steel backing strip which extends along the junction, the steel backing strip having a cross-section which is a segment of a circle, the flat surface of the strip being in contact with the steel plates on either side of the junction and the strip being free of concontact with the fusion faces of the steel plates

(3) supporting the backing strip in a segmental shaped recess in a heat-conductive support block, the radius of curvature of the recess being substantially the same as the radius of curvature of the curved surface of the backing strip whereby good contact is obtained between the backing strip and the support block for conduction of heat from the backing strip to the support block; and

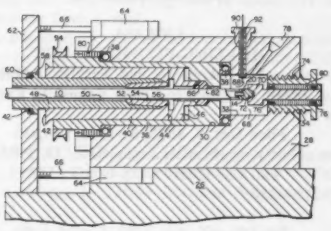
(4) welding together the two plates and the backing strip from the side of the steel plates opposite to the backing strip with an automatic metal arc welding machine using a current in the range of from 350 to 1500 amps.

4,075,454

PROCESS AND APPARATUS FOR SEALING NUCLEAR REACTOR FUEL

Robert Duncan, and Richard P. Barna, both of Columbia, S.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 399,767, Sept. 20, 1973, abandoned. This application Sept. 10, 1975, Ser. No. 612,112
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—137 R **6 Claims**



1. Apparatus for pressurizing a fuel rod and sealing a plug in an end thereof comprising:

a base supporting a housing having a gas chamber and rotatable members therein;

a fuel rod adapted to be held by said rotatable members, said fuel rod having a closed end positioned outside said housing and a plug frictionally held in the other end, a radially extending orifice in said plug which communicates with the interior of said fuel rod;

a gas chamber in said housing positioned adjacent said rotatable members, said chamber having a fuel rod stop member therein and being constructed and arranged to receive said plug end of the fuel rod;

a gas inlet to said gas chamber so that gas introduced thereinto flows through the plug orifice to pressurize said fuel rod;

actuating means on said housing including a hydraulically actuated ram connected to said rotatable members which causes said rotatable members to firmly grasp the fuel rod and simultaneously effect sealing of the plug end of said fuel rod in the gas chamber;

drive means connected with said rotatable members for rotating said fuel rod at a predetermined speed; and

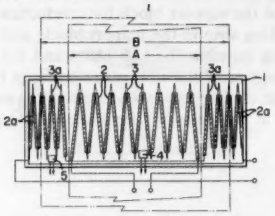
an electrode in said gas chamber for simultaneously sealing said orifice in the end plug and said plug in the fuel rod when the fuel rod is rotated by said rotatable members.

4,075,455

FIXING DEVICE FOR AN ELECTROPHOTOGRAPHIC COPYING MACHINE

Ko Kitamura; Mamoru Watanabe; Yojiro Watanabe, and Yutaka Seto, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed July 28, 1976, Ser. No. 709,523
Claims priority, application Japan, July 30, 1975, 50-92070
Int. Cl.[2] G03G *15/20;* H05B *1/00*
U.S. Cl. 219—216 6 Claims



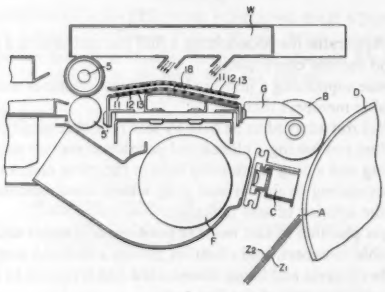
1. A fixing device for use in an electrophotographic copying machine comprising a fixing plate having a width substantially equal to the maximum width of recording sheets in use and a heater disposed transversely of the fixing plate, said heater being divided into heater sections in the direction of width of the recording sheets corresponding to the widths thereof, and a temperature sensing element associated with each of the divided heater sections and means for controlling supply of power to said heater sections in response to the output of said temperature sensing elements.

4,075,456

HEATING-FIXING DEVICE

Hisashi Sakamaki, Yokohama, and Toshiyuki Ohtani, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1975, Ser. No. 638,915
Claims priority, application Japan, Dec. 13, 1974, 49-143280
Int. Cl.[2] H05B *1/00;* G03G *15/20*
U.S. Cl. 219—216 6 Claims



1. A heating-fixing device for fixing a developed electrophotographic image comprising:

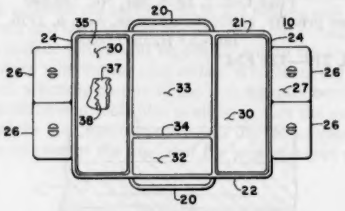
a pair of heating members, each including a heat-resistant, insulative substrate and a heating element provided on said substrate, said heating elements being opposed to each other with a path for a copy material having a developed image thereon being interposed therebetween, wherein said heating elements are coated with a thin film of a material having a high heat resistance and a low coefficient of friction, and further comprising means for imparting an air flow to bring the copy material into contact with one of said two heating members.

4,075,457

PEDICURE TREATMENT UNIT

E. Elaine Williams, Cranford, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,333
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—218 1 Claim



1. A portable unit for use in rendering of a pedicure treatment in the form of a bench,

said bench fitted on each side with at least one storage compartment, each fitted with a cover resting on the top of each storage compartment, with

a pair of recessed first chambers, each open to the top of said unit and spaced apart from each other by a central recessed second chamber open to the top of said unit,

said first chambers each fitted with a removable bath pan and with walls of said first chambers each fitted with heating means, such that

a patient may bathe each foot in an individual first chamber, with the bottom of the central compartment serving as a rest upon which the patient may place either foot for treatment by an operator in front of the unit, with

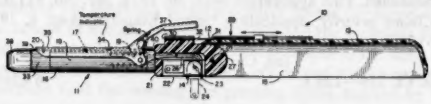
said storage compartments serving as containers for treatment implements and towels.

4,075,458

COMPACT HAIR CURLING IRON

Alan Ray Moyer, Natick, Mass., assignor to The Gillette Company, Boston, Mass.

Filed July 8, 1976, Ser. No. 703,580
Int. Cl.[2] A45D *1/04, 2/24;* H01R *11/02;* H05B *1/00*
U.S. Cl. 219—225 5 Claims



1. A hair curling iron comprising:

a handle having a concave portion;

hair curling means including an elongated tubular member provided with an electric heating element for heating said tubular member, and a mounting member having a cavity, a first end and a second end, said first end of said mounting member being connected to an end of said tubular member, said concave portion of said handle being of such size as to receive and accommodate said tubular member and said mounting member, said second end of said mounting member being pivotally connected to said handle in such a manner as to permit said tubular member and said mounting member to be folded into said concave portion of said handle; and

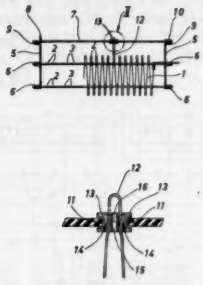
plug means for conducting current to said electric heating element, said cavity being of such size as to receive said plug means, said plug means being connected to said mounting member in such a manner as to permit said plug means to be moved between a first operative position wherein said plug means is extended outwardly of said

cavity when said tubular member is unfolded from said concave portion of said handle whereby said plug means is accessible for connecting to a power source and a second inoperative position wherein said plug means is withdrawn within said cavity to permit said tubular member to be folded into said concave portion of said handle.

4,075,459
VOLTAGE TAPPING IN ELECTRICAL HEATING ELEMENTS

Ludwig Lieber, Steinweiler, Germany, assignor to Firma Fritz Eichenauer, Germany

Filed Dec. 23, 1975, Ser. No. 643,758
Claims priority, application Germany, Dec. 28, 1974, 2461754
Int. Cl.[2] H05B *3/02*; F24H *3/04*; H01C *1/148*
U.S. Cl. 219—375 **4 Claims**

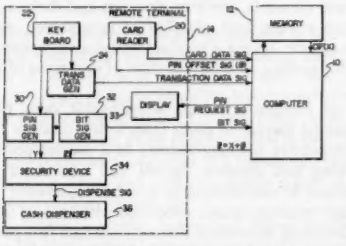


1. A heater element for an electrical appliance, said element consisting of a resistance heating wire which is looped as a series of reaches arranged in linear formation and having a plurality of tips with the loops being held against displacement, in planes disposed in succession transversely of the flow direction of the air, by at least one support plate which is arranged parallel to the flow direction, and a voltage tapping on the loops for providing an electrical supply to a component of the appliance, wherein at least one insulating material plate is arranged approximately parallel to said at least one support plate outside the region of the loops, and at least one of the loops, serving as a voltage tapping, projects beyond the other loops and the tip of said at least one loop is attached to one of said at least one insulating plate to form an electrical voltage tap connection.

4,075,460
CASH DISPENSING SYSTEM

Richard A. Gorgens, Bedford, Mass., assignor to Incoterm Corporation, Wellesley Hills, Mass.

Filed Nov. 28, 1975, Ser. No. 635,882
Int. Cl.[2] G06K *5/00*; G06F *7/00*
U.S. Cl. 235—420 **14 Claims**



1. A cash dispensing system having

a central computer and associated memory and computer signal transfer means, for maintaining customer account records,

at least one remote transaction terminal, and a communication path interconnecting said remote terminal with said computer,

wherein each of said remote terminals includes means for generating a transaction data signal representative of a desired transaction in response to a customer initiated operation, and for transferring said transaction data signal to said computer, and wherein said computer signal transfer means includes means responsive to said transaction data signal from a remote terminal to generate a multiple bit customer information file (CIF) signal and to transfer said CIF signal to said remote terminal via said path, said CIF signal being representative of a predetermined multiple bit CIF data word associated with said customer, and said remote terminals include a cash dispensing apparatus comprising:

A. input means comprising a personal identification number (PIN) signal generator for generating a multiple bit PIN signal in response to a manual operation performed by said customer, said PIN signal being representative of a predetermined multiple bit PIN data word associated with said customer and bearing a predetermined relationship to said CIF signal,

B. a security device including a comparator means, said comparator means being responsive to said PIN and CIF signals to generate a DISPENSE signal only when said PIN and CIF signals bear said predetermined relationship,

C. transfer means comprising a PIN signal transfer means for transferring said PIN signal directly to said security device,

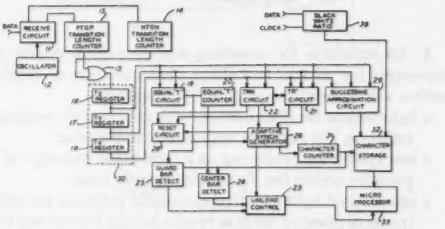
D. receiving means comprising a CIF signal receiving means for receiving said CIF signal as transferred from said computer and for transferring said received CIF signal to said security device, and

E. a cash dispenser for storing cash units and dispensing one or more of said cash units in response to said DISPENSE signal.

4,075,461
UPC SYMBOL DECODING SYSTEM

Paul S. Wu, Randolph, and Robert V. Reago, N. Plainfield, both of N.J., assignors to Litton Business Systems, Inc., Pine Brook, N.J.

Filed May 3, 1976, Ser. No. 682,246
Int. Cl.[2] G06K *7/14*
U.S. Cl. 235—466 **9 Claims**



1. A symbol decoding system for decoding symbols comprised of plurality of bars, some of which represent characters, comprising:

means for providing a series of pulses representative of said bars;

first counting means for counting the interval between negative-to-negative transistions between adjacent pulses in said series of pulses;

second counting means for counting the interval between positive-to-positive transitions between adjacent pulses in said series of pulses;

means coupled to said first and second counting means for storing data representing said counted intervals compris-

ing register means arranged in push-down stack, said register means comprising:

a first register for storing a first such transition interval;

a second register for storing a second such transition interval; and

a third register for storing a third such transition interval;

each subsequently-received transition interval being applied to said register means, said register means thereupon causing the previously-stored contents of each of said registers to shift position in said stack;

testing means coupled to said register means for testing for certain predetermined relationships among said counted intervals; and

identifying means for identifying particular characters whenever said predetermined relationships are satisfied.

4,075,462

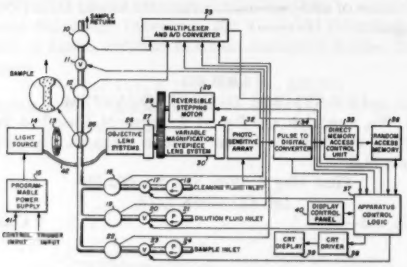
PARTICLE ANALYZER APPARATUS EMPLOYING LIGHT-SENSITIVE ELECTRONIC DETECTOR ARRAY

William Guy Rowe, P.O. Box 425, Boonville, Calif. 95415

Filed Jan. 8, 1975, Ser. No. 539,341

Int. Cl.[2] G06M *11/00*

U.S. Cl. 235—92 PC **11 Claims**



1. An apparatus for acquiring and formatting digital data representative of size and shape characteristics of particles within a designated sample zone, comprising:

a light source for illuminating, with coherent or incoherent radiation, the particles within the sample zone;

a lens system for producing on a focal plane an image of the particles within the illuminated sample zone;

a plurality of light-sensitive electronic elements located in the focal plane of the lens system having known and fixed spacings between the elements, each element having individually associated therewith memory means responsive to the light-sensitive elements for receiving and retrievably storing an analog of the total illumination incident upon each light sensitive element;

interrogating means responsive to the memory means for individually sampling the analog of the total illumination level incident upon each light-sensitive electronics element; and,

quantizing means for receiving each analog output from the interrogating means and converting each analog output into a digital data field representative of the illumination level incident upon each element of the array.

4,075,463

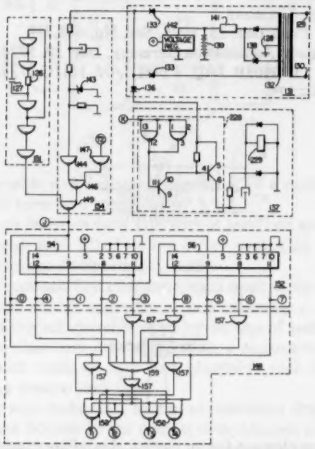
DEVICE FOR AUTOMATICALLY SUPPLYING DRINKS AND FOODSTUFFS

Jose Miguel Yurramendi Eguizabal, Avenida del Generalisimio, 32, San Sebastian, Spain

Continuation-in-part of Ser. No. 664,036, March 4, 1976, abandoned, which is a continuation of Ser. No. 439,864, Feb. 6, 1974, abandoned. This application Mar. 1, 1977, Ser. No. 773,405

Int. Cl.[2] G06M *3/08*; G07F *11/00*

U.S. Cl. 235—92 AC **6 Claims**



1. A device for dispensing products such as foodstuffs in locations such as hotel rooms, said device comprising:

a receptacle assembly having therein a plurality of receptacles arranged in a plurality of rows and a plurality of columns, each of said receptacles adapted to contain therein a product, said receptacle assembly being modular and comprising:

two symmetrical opposite lateral end elements spaced and positioned parallel to each other, each said end element having thereon inwardly facing slide elements;

a plurality of intermediate partition elements arranged parallel to each other and parallel to said end elements, each said partition element having thereon oppositely facing slide elements;

said end elements and partition elements being laterally spaced to provide a desired said plurality of columns,

a plurality of groups of shelves positioned between each pair of adjacent partition elements and between each end element and adjacent partition element, each said shelf fitting on said slide elements, the shelves of each group being spaced, and the spacing between shelves of each of said plurality of groups being the same, thus providing a desired said plurality of rows; and

said end elements, partition elements and shelves defining therebetween said plurality of receptacles, each said receptacle having a product withdrawal opening;

means for cooling at least a portion of said rows of receptacles;

each said receptacle having a swingable door pivotably connected thereto to pivot from a first position blocking the respective opening thereof to a second position unblocking said opening thereof and whereat a product contained in said receptacle may be withdrawn;

electrical detection means associated with each of said doors for detecting movement thereof from said first position to said second position and for producing an electric signal representative of such movement, said detection means of each said receptacle being codified to produce an electric

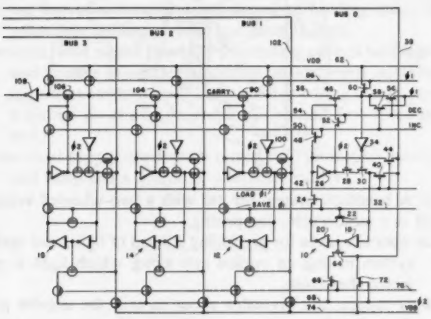
signal weighted to represent the value of the product in said each receptacle; and

electronic circuit means, operatively connected to all of said detection means, for receiving said signals from said detection means and for accumulating said signals as a record of consumption of products from said assembly.

4,075,464
INCREMENTER/DECREMENTER CIRCUIT

Thomas J. Davies, Jr., San Jose, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed May 2, 1977, Ser. No. 792,617
Int. Cl.[2] G06M *3/14;* H03K *23/30*
U.S. Cl. 235—92 EV **7 Claims**



1. A digital incrementing/decrementing circuitry for receiving a binary number from a data bus, selectively incrementing and decrementing the number, and re-applying the new number to the data bus, said circuitry comprising:

a plurality of storage cells, one cell of said plurality being coupled to each conductor in the data bus, each cell in said plurality having a closed data circulation path containing an odd number of signal inverters and at least one signal gating means;

a first conductor intercoupling each of said plurality of cells, the end of said first conductor adjacent the least significant digit cell of said plurality of storage cells being selectively discharged at first predetermined times;

pre-charging means for charging said first conductor with a positive voltage at second predetermined times;

circuitry coupling said first conductor with the signal gating means in each cell of said plurality for enabling said gating means upon the selective discharging of said first conductor;

a plurality of switching means interposed in said first conductor, one of said switching means being associated with each of said plurality of storage cells, each switching means in said plurality being rendered conductive by the simultaneous application of a selectively applied incrementing signal and a first polarity signal in said cell and by the simultaneous application of a selectively applied decrementing signal and a first polarity signal in a signal inverted section of said cell;

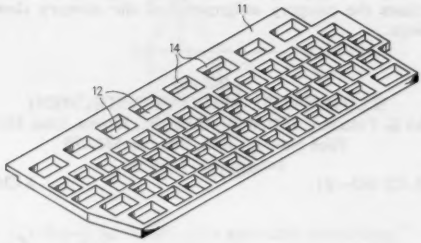
loading means operative during said second predetermined time for loading data from each conductor in said data bus into its respective cell; and

re-loading means for applying the binary number from said plurality of storage cells into said data bus.

4,075,465
KEYBOARD OVERLAY

Buddy Keith Funk, Bountiful, and Elton Earl Tetrick, Draper, both of Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 19, 1976, Ser. No. 687,836
Int. Cl.[2] B41J *5/08;* G06C *7/02*
U.S. Cl. 235—145 R **6 Claims**



1. A structure for mounting on a keyboard containing a plurality of keys, comprising in combination:

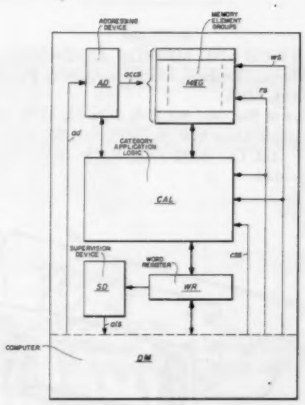
an overlay disposable on the keyboard and having a plurality of inside surfaces defining openings for each of the keys of the keyboard; and

a portion of at least some of said inside surfaces, which define said openings, being sloped and displaying a symbol associated with respective ones of said keys.

4,075,466
METHOD OF AND ARRANGEMENT FOR DETECTING FAULTS IN A MEMORY DEVICE

Björn Erik Rutger Jonsson, Järfälla; Ulf Ivan Gunnar Andersson, Bandhagen, and Gustav Ruben Bergman, Alvsjo, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Aug. 30, 1976, Ser. No. 718,839
Claims priority, application Sweden, Sept. 16, 1975, 7510332
Int. Cl.[2] G11C *29/00*
U.S. Cl. 235—302.3 **6 Claims**



1. In a memory device which includes addressable memory element groups for storing binary coded information words and a word register for temporarily storing information words which are transferred to the memory element groups during a writing phase and from the memory element groups during a reading phase wherein a fault in a memory element group is indicated if an incorrect word is registered in the word register

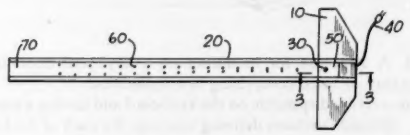
as the result of, during a reading phase, the transfer of the information word in said memory element group to the word register, the method of detecting faults comprising the steps of assigning some of the memory element groups to a first category, assigning other of the memory element groups to a second category, transferring in unchanged form information words between the word register and the memory element groups of the first category, transferring in binary complement form information words between the word register and the memory element groups of the second category, and changing at times the category assignments of the memory element groups.

4,075,467

ILLUMINATED DRAFTING INSTRUMENT

John G. Peterson, 4731 W. Hoffman St., Kearns, Utah 84118

Filed Nov. 17, 1975, Ser. No. 632,470
Int. Cl.[2] F21V *33/00*
U.S. Cl. 362—31 **6 Claims**



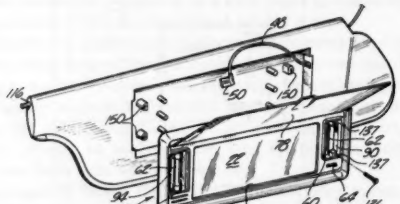
1. A drafting instrument comprising
a top;
a blade projecting from said top, said blade being made of transparent material;
a reflective coating applied to at least a portion of an upper flat surface of the blade;
spaced apart clear beads along the length of the blade, beneath the reflective coating, said beads being in a generally V-shaped pattern and converging on the blade at a location adjacent to the top;
at least one angled mirror arranged to reflect light along the length of the blade;
light means carried by the blade, and light means being positioned to illuminate the angled mirror whereby light is reflected by the mirror along the length of the blade to the clear beads.

4,075,468

VISOR AND MIRROR ASSEMBLY

Konrad H. Marcus, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Continuation of Ser. No. 595,894, July 14, 1975, abandoned.
This application Mar. 9, 1977, Ser. No. 775,714
Int. Cl.[2] B60J *3/00*; F21V *33/00*
U.S. Cl. 362—144 **21 Claims**



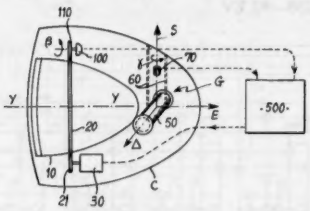
17. A vanity mirror and visor unit for a vehicle or the like comprising; an elongated visor, means delivering electric current from a source to said visor, an elongated vanity mirror assembly supported on said visor, said vanity mirror assembly including an elongated mirror, circuit means including a pair of conductors extending from one end of said mirror to the other, said conductors being attached to and supported on the rear surface of said mirror, said conductors being operatively connected to said means delivering electric current, light means associated with opposite ends of said mirror for illuminating the front surface of said mirror supported by said conductors relative to said mirror and being operatively connected to said conductors, and switch means movable from an open position to a closed position to energize said circuit means to illuminate said light means.

4,075,469

LIGHTING SYSTEMS FOR MOTOR CYCLES

Jacques Marius Alphen, 67, Allee Jules Verne, La Celle Saint-Cloud, France

Filed Dec. 16, 1975, Ser. No. 641,212
Claims priority, application France, Dec. 19, 1974, 74 42130
Int. Cl.[2] B62J *5/02*
U.S. Cl. 362—72 **14 Claims**



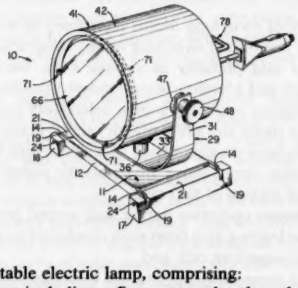
1. A headlight system for use with a two-wheeled vehicle, such as a motorcycle, comprising,
an optical system for producing a beam of light, said optical system having an optical axis along which light is projected therefrom,
a gyroscope unit pivotable about an axis, the angular position of said gyroscope unit about said gyroscope axis at any moment being a function of the angle of inclination which the vehicle makes at that moment with the vertical, and
means responsive to the angular position of said gyroscope unit for rotating said optical system about an axis extending in a front-to-rear direction of said optical system and at no more than a small acute angle to said optical axis, the angular position of said optical system with respect to said optical system axis at any moment being a function of the angular position of said gyroscope unit at that moment.

4,075,470

EMERGENCY LAMP

Charles R. Moore, Mishawaka, Ind.

Filed Dec. 22, 1975, Ser. No. 643,073
Int. Cl.[2] F21L *15/18*; B60Q *1/52*
U.S. Cl. 362—287 **13 Claims**



1. A portable electric lamp, comprising:
base means including a flat rectangular-shaped plate;

a pair of feet pivotally secured to said base means at spaced locations thereon along parallel side edges of said plate and about parallel axes, said parallel side edges of said plate each having a pair of spaced and laterally outwardly and parallel extending tabs thereon each having a first hole therethrough, each of said feet having a pair of parallel slots in a surface thereof, said slots having a sufficient depth to receive said tabs therein so that said hole is beneath said surface, each of said feet adjacent said slots having second holes therein, said second holes opening into said slots and the axis of each of said second holes extending perpendicular to the longitudinal axis of said slots, said second holes being aligned with said first holes;

at least one pin received in said aligned first and second holes on each foot for pivotally securing each one of said feet to said tabs;

a U-shaped bracket having a pair of upstanding and parallel legs and a bight portion connecting said legs;

first pivot means pivotally connecting said bight portion of said bracket to said base means and for movement about a first pivot axis;

lamp holding casing means received between said upstanding legs of said bracket and including holding means for releasably holding at least one lamp therein;

second pivot means pivotally connecting each of said legs of said bracket to said lamp holding casing means and effecting a movement of said lamp holding casing means about a second pivot axis perpendicular to said first pivot axis; and

electrical supply connection means for connection between said lamp and a source of electrical energy.

4,075,471

LAMP ASSEMBLY

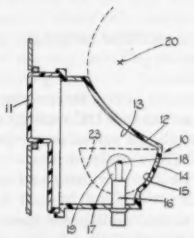
Kenneth James Jones, Sutton Coldfield, England, assignor to Lucas Electrical Company Limited, Birmingham, England

Filed Oct. 8, 1975, Ser. No. 620,791

Claims priority, application United Kingdom, Oct. 17, 1974, 45134/74

Int. Cl.[2] F21V *7/02*

U.S. Cl. 362—300 **10 Claims**



1. A lamp assembly comprising a housing, an ellipsoidal reflector and bulbholder arrangement in said housing, a convex mirror in said housing positioned to receive light emanating, in use, from said arrangement, and a window in said housing, said convex mirror lying on a paraboloidal surface formed by rotating a parabola about an axis which is perpendicular to a focal axis of said ellipsoidal reflector and being disposed in said housing so that a focal point of said parabola lies on an outer focal point of said ellipsoidal reflector, whereby, in use, said convex mirror reflects a substantially parallel beam of light through said window.

4,075,472

REFLECTOR FOR FLASH LIGHT APPARATUS

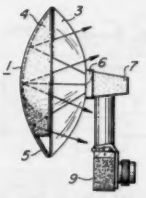
Masaru Higuchi, Toyonaka, Japan, assignor to West Electric Co., Ltd., Osaka, Japan

Filed Mar. 8, 1976, Ser. No. 665,073

Claims priority, application Japan, Mar. 11, 1975, 50-29864

Int. Cl.[2] F21V *7/02*

U.S. Cl. 362—255 **5 Claims**



1. A reflector for a flash light apparatus, comprising:

a sealable container made of a soft material selected from the group consisting of vinyl chloride, nylon and high pressure polymerized polyethylene and consisting of a light transmissive portion and a light reflecting portion, said container being inflatable into a sphere by confining a gas therein;

gas inlet means attached to said container for introducing said gas into said container; and

mounting means attached to the outside of the light transmissive portion of said container for mounting said flash light apparatus, light directed from said flash light apparatus being transmitted from the outside of said container through said light transmissive portion of said container and reflected by the light reflecting portion of said container back out through said light transmissive portion.

4,075,473

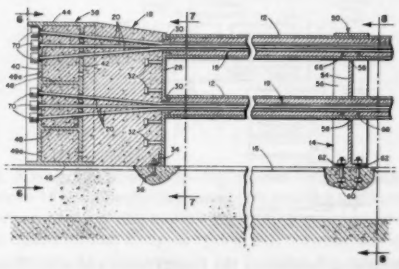
CABLE-REINFORCED SAFETY BARRIER

George Winston, 1770 Bay Road, Miami Beach, Fla. 33139

Filed May 12, 1976, Ser. No. 685,985

Int. Cl.[2] E01F *15/00*

U.S. Cl. 256—13.1 **16 Claims**



1. A safety barrier comprising:

substantially horizontal rail means having a recess,

support means supporting said rail means at intervals along the length thereof,

cable means disposed in said recess,

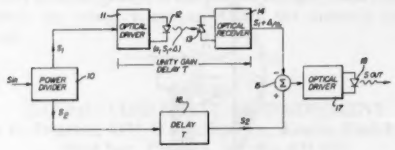
cable holding means disposed within said recess and comprising a mass of grout or the like interposed between the outer surface of said cable means and the inner surface of said rail means, and extending along at least portions of said rail means, and

cable anchoring means at each end of said cable means, said cable means being secured to said anchoring means.

4,075,474
METHOD AND APPARATUS FOR DISTORTION REDUCTION IN OPTICAL COMMUNICATION SYSTEMS

Jozef Straus, and Otto Istvan Szentesi, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 19, 1977, Ser. No. 788,789
Int. Cl.[2] H04B 9/00; G05D 25/02
U.S. Cl. 250—199 **10 Claims**



1. An optical transmitter having two parallel signal paths and comprising:

signal dividing means for coupling a first component of an electrical input signal to a first of said signal paths, and a second component of said input signal to a second of said signal paths;

said first signal path including a first electrical-to-optical converter optically coupled to an optical-to-electrical converter;

said second signal path providing a predetermined electrical delay;

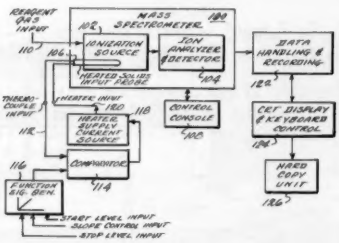
means providing the instantaneous difference between signals at the ends of said first and second signal paths; and

a second electrical-to-optical converter for converting said instantaneous difference into an optical output.

4,075,475
PROGRAMMED THERMAL DEGRADATION-MASS SPECTROMETRY ANALYSIS METHOD FACILITATING IDENTIFICATION OF A BIOLOGICAL SPECIMEN

Terence H. Risby, State College, Pa., and Alfred L. Yergey, III, Columbia, Md., assignors to Chemetron Corporation, Chicago, Ill.

Filed May 3, 1976, Ser. No. 682,781
Int. Cl.[2] B01D 59/54; H01J 39/34
U.S. Cl. 250—282 **56 Claims**



1. A method facilitating the classification and identification of an unknown biological specimen, said method comprising the following steps:

(a) providing a physical sample of at least one biological specimen;

(b) controllably heating said sample in accordance with a predetermined non-isothermal time dependent function so as to cause the sample temperature to increase from a first predetermined temperature to a second higher predetermined temperature during a correspondingly predetermined time span thereby causing the sample to undergo controlled thermal degradation and to give off a characteristic time dependent sequence of gaseous degradation components;

(c) providing a mass spectrometer having an ionization source therein;

(d) directly passing said gaseous degradation components within said ionization source from said heating step and ionizing said components in the same characteristic time dependent sequence involved in the formation of said components during said heating step to provide a respectively corresponding time dependent sequence of ions of said components; and

(e) analyzing and detecting the mass of at least some of said ions of the components within said mass spectrometer during said predetermined time span and recording a set of measured data representing the respective quantities of ions having particular masses being produced as a function of time or temperature during said predetermined time span;

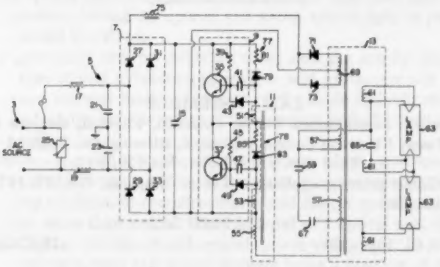
(f) said steps *a–e* above being carried out at least once for a sample of biological specimen having known predetermined identity;

(g) said steps *a–e* above being repeated at least once for a sample of biological specimen having unknown identity thereby facilitating the classification and identification of such unknown biological specimen through comparison of the set of measured data resulting therefrom with the set of measured data resulting from said steps *a–f*.

4,075,476
SINUSOIDAL WAVE OSCILLATOR BALLAST CIRCUIT

Ira J. Pitel, Pittsburgh, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 20, 1976, Ser. No. 752,167
Int. Cl.[2] H05B 37/02, 39/04, 41/36
U.S. Cl. 315—209 R **10 Claims**



1. A sinusoidal wave oscillator ballast circuit comprising:

an AC potential source;

a DC rectifier means;

a power factor corrector circuit means coupled to said AC potential source and to said DC rectifier means;

oscillator means including a pair of series connected transistors shunting said DC rectifier means;

a first transformer having a primary and secondary windings, said secondary winding of said first transformer directly coupled to said oscillator means;

a second transformer having a primary winding and a first and second secondary winding, said primary windings of said first and second transformers in series connection with a capacitor to form a resonant circuit shunted across said oscillator means, said first secondary winding of said second transformer coupled to lamp circuitry to form a load circuit in shunt connection across said capacitor of said resonant circuit and said second secondary winding of said second transformer connected by a pair of diodes to said DC rectifier means to effect clamping thereof at a given potential level whereby said given potential level is maintained despite open circuiting of said load circuit; and

circuit means coupled to said oscillator means for effecting

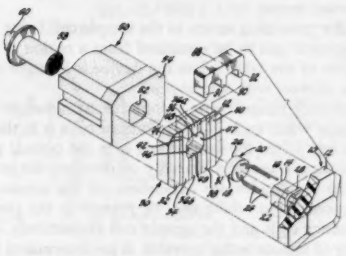
correction for storage time of said transistors of said oscillator means.

4,075,477

OPTICAL-ELECTRONIC INTERFACE CONNECTOR

Richard J. Hanson, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1977, Ser. No. 779,312
Int. Cl.[2] G02B 5/16
U.S. Cl. 250—227 **1 Claim**



1. Apparatus for connecting and interfacing the end of an optic signal conduit with electrical signal conducting means, comprising, in combination:

an optic-electronic signal conversion element having a body with means for communication with the end of the optic signal conduit and a plurality of electrically conducting leads;

a first housing member having an elongated portion with a free end adapted to receive the body of the optic-electronic signal conversion element, the elongated portion further having a plurality of sides each adapted to receive an electrically conducting lead of said signal conversion element therealong;

a second housing member having an opening adapted to receive the elongated portion of the first housing member therein and further having means adapted to receive the end of the optic signal conduit in communication with the optic-electronic signal conversion element;

an elastomeric ring comprising a plurality of axially extending layers of alternating electrically conducting and insulating elastomeric materials, the ring being disposed between the first and second housing members around the elongated portion of the first housing member with a separate layer of electrically conductive material for each electrically conducting lead biased into contact therewith, a portion of the ring including the electrically conducting layers extending outward from between the first and second housing members;

a third housing member adapted to receive the first and second housing members therein and including one or more internal electric contacts adapted to contact the electrically conducting layers of material in the outwardly extending portion of the elastomeric ring with the first and second housing members so received, the contacts communicating with the electrical signal conducting means, whereby the electrical leads of the signal conversion element are also made to communicate with the electrical signal conducting means.

4,075,478

FLOATING HEAD ENCODER

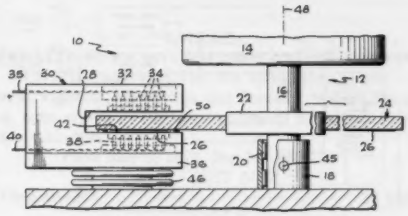
Ralph Eldridge Walker, Canoga Park, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed June 3, 1976, Ser. No. 692,622
Int. Cl.[2] G01D 5/34
U.S. Cl. 250—231 SE **8 Claims**

1. An improved optical encoder for generating an electrical signal representative of the rotational position of a shaft, of the type having

a non-rotating optical head including light sources and light sensors connected by light paths,

a commutator including a coded pattern thereon mounted for rotation with the shaft through the light paths, wherein the improvement comprises:



snubber means mounted to the optical head for contact with the commutator to maintain a constant air gap between the coded pattern and the optical head, and

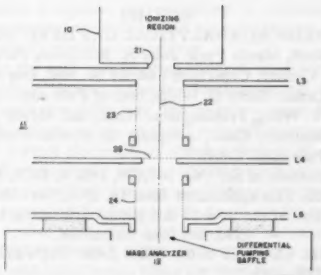
means for urging the commutator and snubber posts into contact with each other.

4,075,479

FOCUSING ION LENS SYSTEM FOR MASS SPECTROMETER FOR SEPARATING CHARGED AND NEUTRAL PARTICLES

John R. Reeher; Michael S. Story, both of Los Gatos, Calif., and Ronald D. Smith, Bovingdon, England, assignors to Finnigan Corporation, Sunnyvale, Calif.

Filed Mar. 4, 1976, Ser. No. 664,047
Int. Cl.[2] H01J 39/34
U.S. Cl. 250—281 **3 Claims**

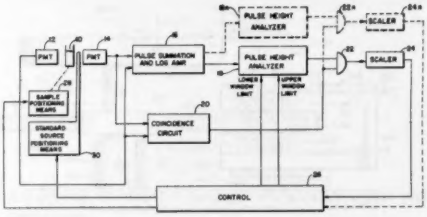


1. A mass spectrometer having an inlet system for admitting samples to be characterized, means for ionizing said samples to produce charged and neutral particles, a mass analyzer, and lens means located along an optical axis between said ionizing means and said mass analyzer for focusing the resultant ions into said mass analyzer, said lens means comprising a plurality of conductive lens elements in the direction of said axis said lens means forming a potential well along said axis to focus a selected charged particle into said mass analyzer while allowing the remaining particles to escape whereby a selected charged particle passes directly along said axis from said ionizing means to said mass analyzer said lens means including first and second enclosures having walls substantially transparent to said remaining particles for allowing their escape and separated by a plate substantially transparent to said selected particles, and voltage source means for applying a relatively high voltage to said plate relative to both of said enclosures to form said potential well.

4,075,480
QUENCH DETERMINATION IN LIQUID SCINTILLATION COUNTING SYSTEMS

Donald L. Horrocks, Placentia, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed June 7, 1976, Ser. No. 693,673
Int. Cl.² G01T *1/00*
U.S. Cl. 250—328 **8 Claims**



1. A method of measuring the degree of quench associated with a sample in a liquid scintillation medium comprising the steps of:

exposing the sample to radiation from a standard source for interaction therewith to produce Compton scattering of electrons having a Compton scattered electron energy distribution or pulse height spectrum, the pulse height spectrum being defined at a high energy end thereof by a Compton edge configuration;

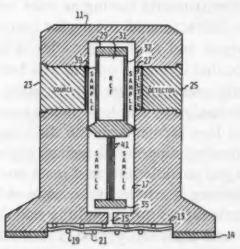
analyzing the shape of the Compton edge to identify a unique characteristic of the Compton edge and measuring a pulse height value corresponding thereto; and

comparing the pulse height value measured for the sample with a pulse height value measured in a like manner for a calibration standard, the difference in the measured pulse height values being indicative of the degree of quench present in the sample.

4,075,481
MEDICAL-ANALYTICAL GAS DETECTOR

Paul E. Stoft, Menlo Park; John A. Bridgham, Palo Alto; Robert L. Chaney, Cupertino; Charles M. Hill, Los Altos; John K. D. Lazier; Barry G. Willis, both of Palo Alto, all of Calif.; Jacob Y. Wong, Framingham, Mass., and Moshe A. Fostick, San Francisco, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 547,670, Feb. 6, 1975, Pat. No. 3,987,303. This application June 14, 1976, Ser. No. 695,339
The portion of the term of this patent subsequent to Oct. 19, 1993, has been disclaimed.
Int. Cl.² G21F *3/02*; G21K *3/00*; G01N *21/34*
U.S. Cl. 250—343 **12 Claims**



1. A device for detecting a component gas in a sample gas comprising:

a housing;

source means mounted within the housing for providing radiation in a preselected spectral band having at least one absorption line of the component gas to be detected;

detector means mounted in the housing for detecting radiation in the preselected spectral band;

a plurality of reference cells, each reference cell containing a reference gas including a standard amount of said component gas to be detected;

a sample cell for containing a quantity of sample gas including the component gas to be detected; and

sequencer means in the housing for introducing in time sequence each of the reference cells and also the sample cell into an optical path between the source means and the detector means;

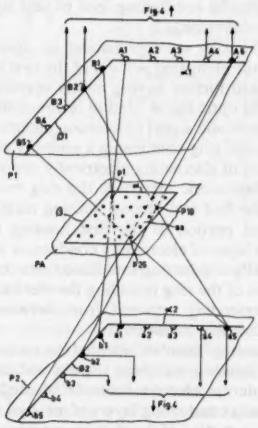
means for providing access to the sample cell for at least the component gas to be measured from a region of the skin surface of the body when the device is brought into intimate contact with said region;

said detector means being responsive to radiation incident thereon when each of the reference cells is in the optical path and when the sample cell is in the optical path, for producing thereby a plurality of detector output signals whose amplitudes are dependent on the amount of the component gas which may be present in the plurality of reference cells and the sample cell respectively, said plurality of signals being operable in predetermined formulation to provide an indication of the concentration of the component gas in the sample gas.

4,075,482
GAMMA-RADIATION TOMOGRAPHY SYSTEM

Jean Robert Périlhou, Bourg la Reine, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,398
Claims priority, application France, Jan. 17, 1975, 75 01471
Int. Cl.² G01T *1/164, 1/20*
U.S. Cl. 250—363 S **12 Claims**



1. A tomography system for direct display of an image of a radio-active body in a defined examination plane PA of examination points utilizing gamma-radiation, comprising:

an array of gamma-radiation comprising:

an array of gamma-radiation detectors situated in a configuration so as to define an array of examination lines each having a gamma-radiation detector at opposing ends thereof, at least two of the examination lines intersecting at each of the examination points;

means for detecting time coincidence of strikes of gamma-rays at the detectors at the opposing ends of each examination line indicative of a pair of gamma rays originating at the corresponding examination point

means for generating a signal for each examination point

proportional to the product of the number of time coincidence strikes detected at the two examination lines intersecting thereat; and

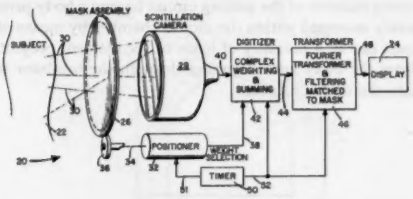
means for displaying the signals as an image of the plane of examination points.

4,075,483

MULTIPLE MASKING IMAGING SYSTEM

Roger H. Tancrell, Cambridge; William W. Stoner, Watertown, and David T. Wilson, Billerica, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed July 12, 1976, Ser. No. 704,138
Int. Cl.[2] G01T 1/20
U.S. Cl. 250—363 S **23 Claims**



1. A system for imaging non-diffracting radiation comprising:

a detector of such radiation incident thereupon from a subject, said detector including means for providing an array of signals representing locations of impingement of said radiation upon said detectors;

means for masking such radiation propagating from said subject to said detector, said masking means providing a sequence of spatial modulation patterns to said radiation, the modulation of said radiation by each of said spatial modulation patterns varying the magnitudes of signals of said array of detector signals in accordance with respective ones of said modulation patterns; and

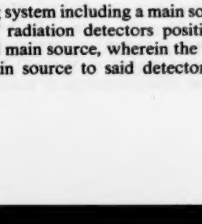
means coupled between said detector and said masking means for digitally filtering signals of said array with weighting factors corresponding to individual ones of said modulation patterns to provide an image of said subject.

4,075,484

DEVICE FOR MEASURING RADIATION ABSORPTION OR EMISSION

Dietrich Meyer-Ebrecht, and Günter Kowalski, both of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 14, 1976, Ser. No. 705,051
Claims priority, application Germany, July 15, 1975, 2531477
Int. Cl.[2] G01T 1/20
U.S. Cl. 250—366 **13 Claims**



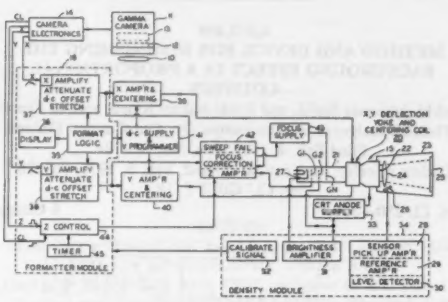
1. In a measuring system including a main source of radiation and a plurality of radiation detectors positioned to receive radiation from said main source, wherein the passage of radiation from said main source to said detectors may be interrupted; the improvement comprising a second source of radiation, means for irradiating said detectors with radiation of said second source when radiation from said main source is not incident thereupon, and circuit means connected to produce the quotient M_1/M_2 for each of said detectors, wherein M_1 is a measuring value of the related detector due to irradiation from said main source and M_2 is a measuring value of the relevant detector due to irradiation from said second source in the absence of incident radiation from said first source.

4,075,485

APPARATUS FOR CONTROLLING AND DISPLAYING SCINTILLATION CAMERA INFORMATION

Robert R. Lijewski, Milwaukee, and Ernest J. Wiesen, Wauwatosa, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed May 6, 1976, Ser. No. 683,732
Int. Cl.[2] G01T 1/20
U.S. Cl. 250—369 **18 Claims**



1. A system having scintillation camera means for producing electric signals corresponding to the *x* and *y* coordinates of scintillations caused by nuclear particles or other radiation being detected by the camera means and for producing electric signals, called *z* signals, corresponding to detected signals which have desired amplitudes and are coincident with said *x* and *y* coordinate signals, comprising:

a cathode ray tube including an electron emissive cathode, an anode, a phosphor screen, electromagnetic deflection coil means for deflecting the electron beam from said cathode on said screen in *x* and *y* directions, respectively, a first control electrode to which a voltage signal is applied for selectively turning on said beam, electrostatic focusing means including an electrode to which a voltage signal is applied for focusing the beam on the screen,

first and second deflection signal amplifier means each having a high slew rate and each having input and output means, said input means being for receiving signals corresponding with *x* and *y* coordinate signals,

said input means of said respective deflection amplifier means including a first amplifier stage for impedance matching having an input for a voltage signal corresponding with one of said coordinate signals and having an output,

a second amplifier stage for amplifying the voltage signal from said last named output and having an output for the amplified voltage signal,

emitter follower buffer third amplifier means having a single ended input for receiving the signals from said second amplifier stage output and having a double ended output,

fourth amplifier means comprising, respectively, a complementary pair of NPN transistors and PNP transistors each having an emitter, a collector and a base, the bases of said transistors being connected to the respective ones of said double ended outputs, and a positive supply voltage terminal having the collector of said NPN transistor connected thereto, and a negative supply voltage terminal having the

collector of said PNP transistor connected thereto said collectors, respectively, serving as output means for said transistors,

fifth amplifier means comprising at least one complementary pair of PNP and NPN transistors, each transistor having an emitter, a collector and a base, bases of said PNP transistors being connected with the output of said fourth stage and bases of said NPN transistors being connected with the output of said fourth stage, a positive supply voltage terminal having the emitters of said PNP transistors connected thereto, a negative supply voltage terminal having the emitters of said NPN transistors connected thereto, an output current terminal having the collectors of all of said PNP and NPN transistors connected thereto, said output current terminal being for coupling with a deflection coil, and

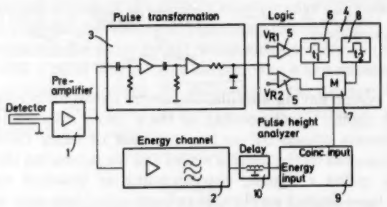
means for coupling signals corresponding with said *z* signals to said first control electrode means for turning on said beam in correspondence with the *x* and *y* coordinate signals with which said *z* signal is substantially coincident.

4,075,486

METHOD AND DEVICE FOR DIMINISHING THE BACKGROUND EFFECT IN A PROPORTIONAL COUNTER

Heikki Johannes Sipilä, and Erkki Sakari Kiuru, both of Espoo, Finland, assignors to Outokumpu Oy, Outokumpu, Finland

Filed Feb. 4, 1977, Ser. No. 765,584
Claims priority, application Finland, Feb. 5, 1976, 760280
Int. Cl.[2] G01T *1/18*
U.S. Cl. 250—374 **6 Claims**



1. A method for diminising the background effect in a proportional counter by using rise time and pulse interval analysis, which comprises

measuring the detector charge pulse collection time caused by electron diffusion;

measuring the interval between the detector pulses;

comparing said measured times with predetermined limit values; and

discriminating detector pulses which have collection times longer than said predetermined rise time as well as pulses which appear at shorter intervals than said predetermined limit value.

4,075,487

IONIZATION CHAMBER ASSEMBLY

Larry D. Larsen, Palatine, Ill., assignor to Patent Development & Management Company, Elgin, Ill.

Filed May 14, 1976, Ser. No. 686,590
Int. Cl.[2] G01T *1/18*
U.S. Cl. 250—385 **56 Claims**

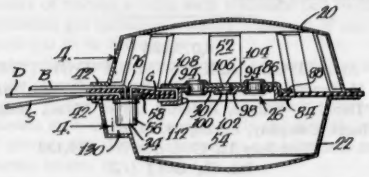
1. In an ionization smoke detector having a sensing circuit responsive to the relative impedances of a closed and an open ionization chamber, an ionization chamber assembly, comprising:

a first cup-shaped electrode defining an outer wall of the closed ionization chamber;

a second cup-shaped electrode defining an outer wall of the open ionization chamber;

a third electrode;

an insulator wall intermediate the first and second electrodes and carrying said third electrode spaced therefrom, said insulator wall defining an interior wall of both the closed and open ionization chambers; and



a circuit element of the sensing circuit having a body protectively mounted within the closed chamber by means of at least one of a plurality of leads of the element projecting from the body and extending through the insulator wall into the open chamber.

4,075,488

PATTERN FORMING APPARATUS USING QUADRUPOLE LENSES

Shigeo Okayama, Mitaka, and Hisazo Kawakatsu, Higashi-Kurume, both of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 610,847, Sept. 5, 1975, abandoned. This application May 19, 1976, Ser. No. 687,690
Claims priority, application Japan, Sept. 6, 1974, 49-101966
Int. Cl.[2] H01J *3/14*
U.S. Cl. 250—396 R **22 Claims**

1. An apparatus for forming a rectangular or linear shaped pattern on an object with a beam of electrically charged particles, which comprises:

a. a source of a beam of electrically charged particles,

b. a diaphragm having a rectangular aperture for shaping the beam into a rectangular beam having four sides,

c. a quadrupole lens system comprising at least one quadrupole lens,

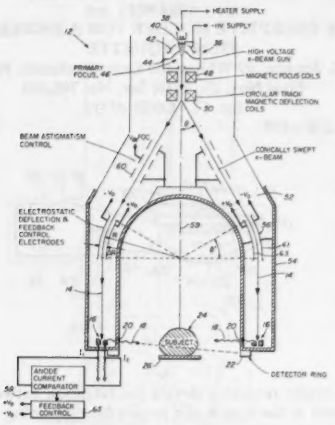
d. means for controlling the quadrupole lens systems for changing the ratio of the lengths of adjacent sides of the the rectangular beam to a desired ratio, and

e. means for shifting the rectangular beam the lengths of whose sides have been changed to impinge upon a desired position on the object.

4,075,489
METHOD AND APPARATUS INVOLVING THE GENERATION OF X-RAYS

William R. Neal, and Roger G. Little, both of Bedford, Mass., assignors to Simulation Physics, Bedford, Mass.

Filed Jan. 21, 1977, Ser. No. 761,064
Int. Cl.[2] H05G 1/30
U.S. Cl. 250—401 15 Claims



1. A method for producing a plurality of distributed X-ray generating sources comprising the steps of:

(a) generating an electron beam having sufficient electron energy for causing emission of X-rays;

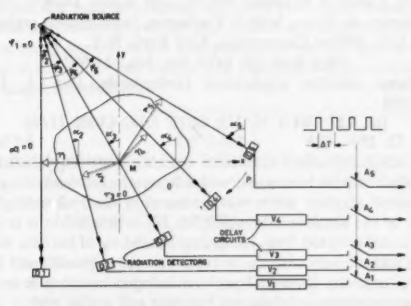
(b) directing said electron beam towards a split anode structure composed of a material that emits X-rays upon impingement of said electron beam;

(c) scanning said split anode structure in a selected pattern with said electron beam, whereby X-rays are generated at the points of electron beam impingement upon said split anode structure, each point of beam impingement constituting an X-ray generating source.

4,075,490
DEVICE FOR MEASURING RADIATION ABSORPTION IN A LAYER OF A BODY

Günter Kowalski, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1976, Ser. No. 675,175
Claims priority, application Germany, Apr. 19, 1975, 2517440
Int. Cl.[2] G01N 23/00
U.S. Cl. 250—445 T 13 Claims



1. In apparatus for measuring radiation absorption in a planar layer of a body of the type including: radiator and detector means which function to simultaneously measure absorption values along a plurality of intersecting straightlines in said plane and to simultaneously produce a plurality of detector signals representative thereof; and means for sequentially rotating said radiator and detector means through a large number of discrete angular displacements about said body; the angles between said lines and between said angular displacements being chosen so that at each of said angular displacements the orientation of one or more of said lines is parallel to the orientation of corresponding other of said lines at one or more prior angular displacements; the improvement comprising:

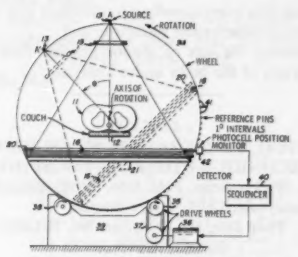
delay means for delaying said detector signals representative of values along said corresponding other lines with respect to said detector signals representative of values along said one or more lines so that sets of signals representative of values along sets of parallel lines are simultaneously produced; and

switch means for simultaneously sampling said sets of signals.

4,075,491
POSITION SENSITIVE X-RAY OR γ-RAY DETECTOR AND 3-D TOMOGRAPHY USING SAME

Douglas P. Boyd, Palo Alto, Calif., assignor to The Board of Trustees of Leland Stanford, Jr. University, Stanford, Calif.

Continuation of Ser. No. 528,025, Nov. 29, 1974, abandoned.
This application Nov. 3, 1976, Ser. No. 738,630
Int. Cl.[2] G01N 21/34
U.S. Cl. 250—445 T 23 Claims



1. A position sensitive detector for detecting divergent rays of penetrating radiation transmitted from a source of penetrating radiation through an object being examined, said detector comprising:

a detector housing;

anode and cathode electrode means spaced apart to define a gap therebetween within said housing, said housing adapted to receive an ionizable gaseous medium disposed in the space between said anode and cathode electrode means; and

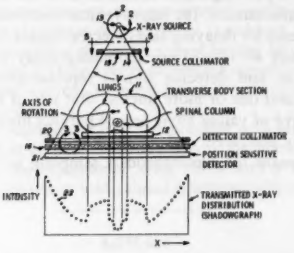
at least one of said spaced apart anode or cathode electrode means including a divergent array of spaced apart elongated electrically conductive electrode portions defining a divergent array of elongated detector gaps therebetween, such elongated electrode portions being elongated along radial lines with a common center at a point in space corresponding to the position of the source of penetrating radiation.

4,075,492

FAN BEAM X- OR γ-RAY 3-D TOMOGRAPHY

Douglas P. Boyd, Palo Alto, Calif., and Michael Goitein, Milton, Mass., assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Nov. 29, 1974, Ser. No. 528,026
Int. Cl.[2] G01N *21/34*
U.S. Cl. 250—445 T **21 Claims**



1. In a method of penetrating ray tomography the steps of:

directing a divergent beam of penetrating radiation through a body to be analyzed from a source on one side of the body to a detector on the other side of the body:

effecting relative angular displacement between the divergent beam of penetrating radiation and the body;

detecting the penetrating radiation that has passed through the body at a number of angularly spaced positions within the angle subtended by the divergent beam for each angular position of the divergent beam relative to the body to derive sets of detected radiation data representative of a plurality of angularly spaced shadowgrams of absorption or transmission of the penetrating radiation by the body, each of said shadowgrams representing the transmission of the penetrating radiation through the body along an array of divergent paths subtended by the divergent beam, and different ones of said sets of angularly spaced sets of shadowgram data corresponding to different sets of intersecting rays of penetrating radiation; and

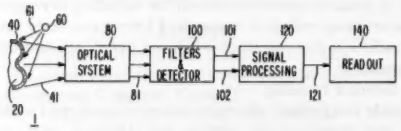
reconstructing the sets of shadowgraphic data into a 3-D tomograph of the body under analysis.

4,075,493

OPTICAL TEMPERATURE MEASUREMENT TECHNIQUE UTILIZING PHOSPHORS

Kenneth A. Wickersheim, Palo Alto, Calif., assignor to Ronald Alves, Sunnyvale, Calif., a part interest

Filed Dec. 16, 1976, Ser. No. 751,366
Int. Cl.[2] G01N *21/38*
U.S. Cl. 250—461 R **23 Claims**



1. A method of determining the temperature of an object, comprising the steps of:

positioning a layer of phosphor material in a heat conductive relationship with said object, said phosphor being characterized by emitting, when excited, electromagnetic radiation within optically isolatable bandwidths at at least two distinct wavelength ranges and with relative intensities therein that vary as a known function of the phosphor temperature,

exciting said phosphor to cause emission of said at least two wavelength bands,

optically directing said phosphor emission to a detecting position, and

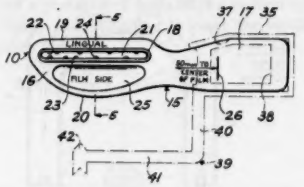
detecting the relative intensities of said at least two distinct wavelength bands, whereby said relative intensity is an indication of the temperature of the phosphor layer and related thereto by said known temperature emission function.

4,075,494

ORALLY RECEPTIVE HOLDER FOR A DENTAL X-RAY FILM PAQUETTE

Arthur C. Jermyn, 99 Whitestone Lane, Rochester, N.Y. 14618

Filed Nov. 29, 1976, Ser. No. 745,562
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—479 **13 Claims**



1. An orally receptive device for retention between preselected teeth in the mouth of a person for supporting and maintaining an x-ray film paquette in proper exposure relation to at least one of the preselected teeth for making an exposure thereof, comprising:

a thin, flat member having a first portion for insertion into the mouth and a second portion continuous and coextensive with the first portion for positioning the first portion in the exposure relationship when the first portion is provided with the film paquette;

the first portion having a generally straight edge, a concave edge that intersects the straight edge and an intermediate area between the edges for engagement by the teeth to hold and maintain the member in the exposure relationship; and

means for holding the film paquette substantially perpendicular to the plane of the member and in close proximity to the teeth comprising an elongated protuberance forming a part of the first portion, extending generally parallel to the straight edge and having at least two parallel facing surfaces of a length greater than the larger dimension of the film paquette and spaced so as to frictionally engage the film paquette when the latter is inserted therebetween.

4,075,495

X-RAY LUMINESCENT SCREEN

Albert Leendert Nicolaas Stevels, and Agnes Desiree Maria Schrama-de Pauw, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 23, 1975, Ser. No. 616,052
Claims priority, application Netherlands, Oct. 1, 1974, 7412918
Int. Cl.[2] G01N *23/223;* G01T *1/00;* C09K *11/46*
U.S. Cl. 250—483 **5 Claims**

1. An X-ray image intensifier screen comprising a substrate a surface of which is coated with a layer of a bivalent europium activated alkaline earth metal samarium fluoro-halide phosphor of the formula: $Me_{1-p-q}Eu_pSm_qFX$ wherein Me is at least one metal selected from the group consisting of barium, strontium and calcium with the proviso that only up to 20 mol % of Me is calcium, X is at least one halogen selected from the group consisting of chlorine, bromine and iodine and

$0.001 \leqq p \leqq 0.20$,

$0.0001 \leqq q \leqq 0.10$ and

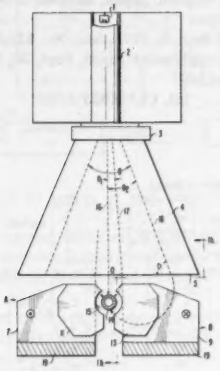
$0.02 \leqq q/p \leqq 0.50$

4,075,496

CHARGED PARTICLE IRRADIATION APPARATUS

Kenichiro Uehara, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed July 7, 1976, Ser. No. 703,143
Int. Cl.[2] H01J *37/00*
U.S. Cl. 250—492 B 7 Claims



1. A charged particle irradiation apparatus of the type having a charged particle accelerating means including an accelerator tube, a charged particle discharging means connected to said accelerator tube and having an opening at the opposite end thereof and a scanning means for scanning the charged particle beam in a first plane, and means including at least a pair of magnetic structures disposed downstream of said opening and being symmetrically positioned about a center line of said scanning pattern to produce opposite d.c. magnetic fields in directions normal to said first plane for deflecting the beam toward a space between said magnetic structures, and an article to be irradiated with the charged particle beam being moved through said space in direction normal to said first plane, wherein the improvement comprises each said magnetic structure having a magnet and a pair of yokes magnetically connected to the opposite poles of said magnet to provide a gap therebetween, across which are lines of magnetic flux normal to said first plane and through which said charged particles pass, said gap being non uniform to produce a non uniform magnetic field intensity with the magnetic field in said gap being greater near said inter magnetic structure spce than it is farther from said space, a magnetic neutral plane disposed in said space which is produced by the cancellation of said opposite d.c. magnetic fields, said deflected charged particles irradiating completely about said article, said magnetic neutral plane being normal to the first plane and intersecting the first plane at the center line thereof and bisecting the space between the magnetic structures.

4,075,497

ELECTRON-OPTICALLY RADIATABLE STRUCTURE

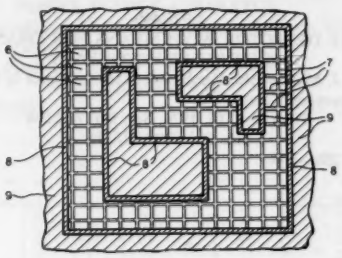
Heinz Kraus, Traunreut, Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Germany

Filed Dec. 31, 1975, Ser. No. 645,924
Int. Cl.[2] G21K *1/00*
U.S. Cl. 250—505 11 Claims

1. A metallic, thin layer diaphragm, having an object structure which forms the pattern for the electron-microscopic reduction of objects, comprising:

an aperture for the passage of electron beams, the aperture being formed by a thin perimeter which surrounds and defines the aperture and by a reinforcing member of substantially greater thickness than the perimeter, set away from the aperture and adjacent to the perimeter, which forms a mechanical reinforcement for the perimeter;

at least one electron absorbing, object structure within the aperture, said structure having a thin periphery and an interior of substantially greater thickness than the periphery to provide mechanical reinforcement for the periphery;



a meshlike supporting screen, formed by a plurality of screen elements, extending across the aperture and connecting the object structure to the perimeter of the aperture to support the object structure within the aperture;

the elements of the screen having approximately the same thickness as the periphery of the object structure, the width of the elements being so narrow that they are not resolvable by the microscope's electron beam; and

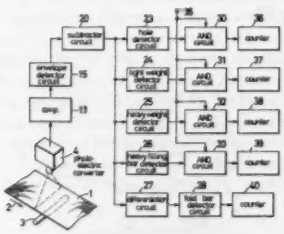
wherein the components of the diaphragm are formed from the same metal.

4,075,498

NON-WOVEN FABRIC DEFECT DETECTING DEVICE

Kaoru Takasuka; Masatatsu Takahashi, and Sadaji Nishimura, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 26, 1976, Ser. No. 670,610
Claims priority, application Japan, Mar. 31, 1975, 50-38672
Int. Cl.[2] G01N *21/32*
U.S. Cl. 250—562 8 Claims



1. A non-woven fabric defect detecting device, comprising:

a light source for irradiating a travelling non-woven fabric by light;

a photoelectric converter for receiving a transmitted light or reflected light from the non-woven fabric and converting it into an electric signal output;

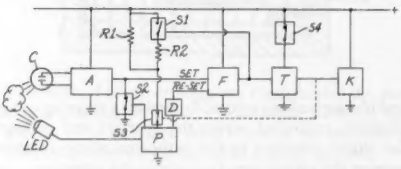
scanning means for sequentially picking up the converted output corresponding to each point on the non-woven fabric in its widthwise direction;

means for classifying the converted output into a plurality of levels and individually detecting a plurality of kinds of defects;

a differentiation circuit for differentiating the converted output;

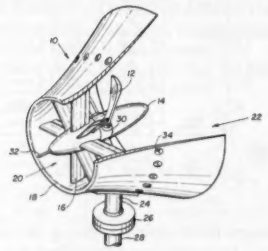
a fold bar detector circuit for detecting a differentiated output exceeding a predetermined level;
and characterized by:
a mean level detector circuit for detecting the mean level of the converted output from the converter; and
circuit means for controlling the light source in accordance with the detected level so that the mean level of the converted output applied to the classifying and defect detecting means is maintained constant.

4,075,499
SMOKE DETECTOR WITH MEANS FOR CHANGING LIGHT PULSE FREQUENCY
William J. Malinowski, Pembroke, Mass., assignor to Chloride, Incorporated, Tampa, Fla.
Filed Nov. 16, 1976, Ser. No. 742,194
Int. Cl.[2] G01N *21/26*
U.S. Cl. 250—574 **4 Claims**



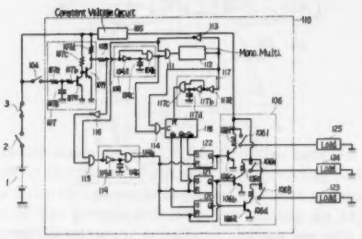
1. A detector, comprising a radiant energy-producing device, pulsing at a predetermined interval, means for producing a signal pulse in response to the pulsed radiant energy under predetermined conditions, means responsive to a predetermined number greater than one of produced signal pulses to provide an output signal, and means responsive to each signal pulse to decrease the interval to the next light pulse to less than that of the predetermined interval.

4,075,500
VARIABLE STATOR, DIFFUSER AUGMENTED WIND TURBINE ELECTRICAL GENERATION SYSTEM
Richard A. Oman, Huntington, and Kenneth M. Foreman, North Bellmore, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Aug. 13, 1975, Ser. No. 604,466
Int. Cl.[2] H02P *9/04*
U.S. Cl. 290—55 **7 Claims**



1. A wind turbine comprising:
a rotatable duct having an outlet to inlet area ratio greater than one;
a wind-rotatable turbine mounted within said duct;
a generator driven by said turbine, said generator being a synchronous generator loading the drive from the turbine; and
stator means to vary the incidence of wind for rotating the turbine wherein the stator means includes a fixed leading portion and a trailing edge flap that is movable relative to the fixed leading portion, said trailing edge flap being movable by means sensitive to wind velocity to vary the swirl imparted to flow thereby providing a good working load distribution to all radial, span, stations of the turbine in optimizing disk loading for the turbine and the duct thereabout, so that with the load on the drive by the generator, constant turbine speed control can be effectuated over a wide range of wind velocities.

4,075,501
ELECTRIC CIRCUIT FOR SELECTING OPERATIONAL CONDITIONS OF LOAD
Yoshihiko Kondo, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan
Filed Sept. 4, 1975, Ser. No. 610,437
Claims priority, application Japan, Sept. 30, 1974, 49-113048; May 27, 1975, 50-63697
Int. Cl.[2] H02J *1/00*
U.S. Cl. 307—41 **10 Claims**



1. An electric circuit for selecting operational conditions of loads comprising:
an operational switch to be connected to a source of current;
a relay switch including at least one relay coil and one movable relay contact having a terminal to be connected to a load;
a trigger pulse generating circuit, connected to said operational switch, for producing a trigger pulse when said operational switch is at least once actuated from the closed state to the opened state and again to the closed state within a fixed time; and
a switching circuit, connected to said trigger pulse generating circuit, for actuating said relay switch upon receiving said trigger signal whereby the operationaL condition of said load is changed from one to the other condition, including means for generating a train of pulses at a fixed frequency in response to said trigger signal, means for coupling said pulses to said relay coil for intermittently shifting said contact to a position disconnecting said load from said source of current.

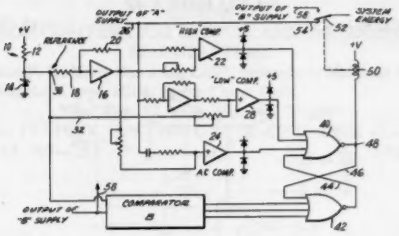
4,075,502
MONITORING DEVICE
Everette D. Walley, Jr., North Chili, N.Y., assignor to General Signal Corporation, Rochester, N.Y.
Filed Nov. 26, 1976, Ser. No. 745,268
Int. Cl.[2] H02H *11/00*
U.S. Cl. 307—64 **4 Claims**

1. A system for selecting one of a plurality of available electrical components in the event that another of the components is subject to failure in accordance with a plurality of functional criteria, comprising:
an input and an output;
selection means for selecting one of the components to be connected between said input and said output, including means for insuring that said selection means operates to select one and only one of said components, whereby

failure of the selection means itself still results in one of the components being connected;

a reference device for supplying an independent positive reference voltage;

said selection means including a group of comparators for each component for comparing on a plurality of bases between each of said components and said reference device, each of said components and said reference device



being connected to inputs of said respective groups of comparators;

a bistable device having its inputs connected to the outputs of all of the individual comparators in said groups of comparators and its output connected to said reference voltage; and

a relay connected to the output of said bistable device for connecting only one or the other of said components to said output.

4,075,503

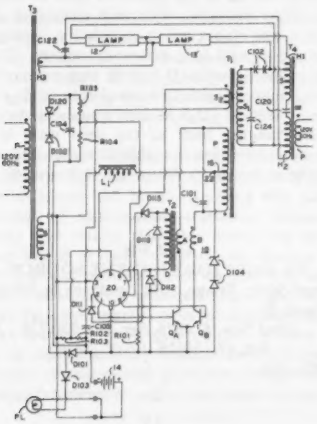
EMERGENCY LIGHTING SYSTEM

Keith K. Klett, 203 E. 13th St., Danville, Ill. 61832

Filed Aug. 26, 1976, Ser. No. 718,029

Int. Cl.[2] H02J *7/00, 9/00*

U.S. Cl. 307—66 **3 Claims**



1. In an emergency lighting system having an inverter circuit for operating at least one gaseous discharge lamp from a battery when AC voltage from an AC electrical energy source falls below a predetermined level, the system being of the type including a transformer connecting the system to the AC source, means for providing an indication that the battery is connected into the system and AC electrical energy is available for charging the battery, and inhibit means monitoring the AC voltage for enabling the inverter when the AC voltage falls below the predetermined level, the improvement comprising:

means including a single secondary winding on the transformer for providing in a substantially non-interacting manner a voltage proportional to the AC voltage to the inhibit means and electrical energy to charge the battery.

4,075,504

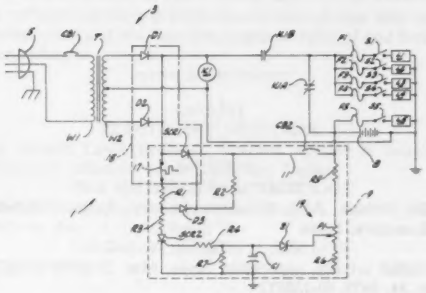
POWER SUPPLY APPARATUS

Donald J. Gnaedinger, Highland, Ill., assignor to Basler Electric Company, Highland, Ill.

Filed May 19, 1977, Ser. No. 798,483

Int. Cl.[2] H02J *9/00*

U.S. Cl. 307—66 **10 Claims**



1. Apparatus for supplying electrical power to d.c. loads such as lights, pumps and the like in a recreational vehicle or the like comprising:

a converter adapted for connection to an a.c. power source external to the vehicle to convert a.c. power therefrom to d.c. power and to supply the d.c. power produced to the loads, the converter having a maximum current output rating;

a chargeable battery for supplying d.c. power to the loads when an external a.c. power source is unavailable;

means for charging the battery with d.c. power supplied by the converter so the battery has sufficient stored energy to supply d.c. power to the loads, the converter supplying power to the battery charging means concurrently with the supply of d.c. power to the loads; and

means responsive to the power demand on the converter both by the d.c. loads and the battery charging means for interrupting the supply of power to the battery charging means when the demand reaches a predetermined level whereby charging of the battery is thereupon interrupted and all the d.c. power up to the maximum current output rating of the converter is made available to the d.c. loads.

4,075,505

MOLECULAR EMISSION LAMP

Robert A. Young, Chatsworth, Calif., assignor to Xonics, Inc., Van Nuys, Calif.

Filed Jan. 10, 1977, Ser. No. 757,824

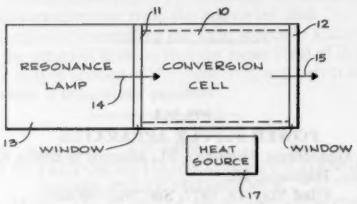
Int. Cl.[2] H02M *5/04*

U.S. Cl. 307—88.3 **33 Claims**

1. A method of producing molecular radiation of a single selected gas, including the steps of:

generating resonance photons characteristic of a single gas and at a first frequency; and

directing said resonance photons into a container of the single gas producing excited molecules of said single gas,



with said molecules emitting incoherent radiation at frequencies lower than said first frequency.

4,075,506

TIMING APPARATUS

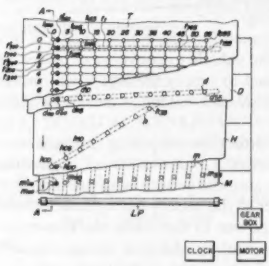
Yohei Nakata, 22-2, Nakahara 2-chome, Isogo, Yokohama, Kanagawa, Japan

Filed Mar. 1, 1976, Ser. No. 662,513

Claims priority, application Japan, Mar. 5, 1975, 50-26717; Dec. 31, 1975, 50-158512

Int. Cl.[2] H01H *43/00*

U.S. Cl. 307—117 **10 Claims**



1. An apparatus comprising one or more timing devices, each timing device including a rotatable time plate having thereon time-representing points where time-indicating logical connection elements are to be provided, said points being arranged at least in one row at equal intervals in the direction of rotation; each timing device further including at least two rotators capable of rotating at different speeds in the vicinity of said time plate and individually holding at least one time-regulating logical connection element: wherein at least one of said time plate and said rotators of each said timing devices is used in common when a plurality of said timing devices are provided and wherein the time-representing point and the time-regulating logical connection element in each of said timing devices are in such positional relation that the time-regulating logical connection element comes into alignment with the time-representing point only at a given time assigned thereto; and the time-indicating logical connection element provided at said point and the time-regulating logical connection element of each rotator in each of said timing devices cooperate to effect timing connection through a logical product obtained at the given time assigned to said point; and either the time plate or the slowest rotator is installed to be stationary.

4,075,507

CIRCUIT ARRANGEMENT FOR EVALUATING SIGNALS, PARTICULARLY OUTPUT SIGNALS OF OPTICAL MEASURING DEVICES

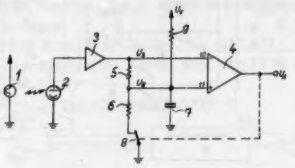
Günter Pauli, Grobenzell, and Gerhard Jahn, Freising, both of Germany, assignors to G.A.O. Gesellschaft fur Automation und Organisation mbH, Germany

Filed Mar. 4, 1976, Ser. No. 663,856

Claims priority, application Austria, Mar. 18, 1975, 2084/75

Int. Cl.[2] H03K *3/42*

U.S. Cl. 307—117 **19 Claims**



1. A circuit arrangement for evaluating signals, particularly output signals of optical measuring devices, such as light barriers, for example, which, by compensating and supervising variations in sensitivity, and with any signal sequence and signal duration, provides an operation signal or a quiescent signal which indicates the presence or absence of the test object and is compared with the voltage of a storage capacitor by means of a comparator, said circuit arrangement comprising, in combination, a measuring device having an output circuit; a voltage divider included in said output circuit; means connecting said output circuit and one end of said voltage divider to one input of said comparator; means connecting the tap of said voltage divider to the other input of said comparator; a storage capacitor connected to said other comparator input and providing a reference voltage (U_R) bearing a fixed relation to, but always lower than, the signal voltage (U_S) of said measuring device in the quiescent state of said arrangement; and means operable, with said measuring device responding to a test object, to so switch the voltages at said comparator inputs that said reference voltage (U_R) is held above said signal voltage (U_S) until said measuring device returns to its quiescent state; said signal voltage (U_S) exceeding said reference voltage (U_R) in such quiescent state and said comparator, changing back to the zero state in response thereto, causes said means operable to switch the voltages at said comparator inputs to return the voltages to the initial conditions.

4,075,508

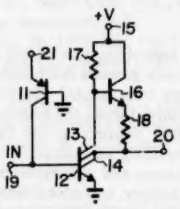
I^2L INJECTOR CURRENT SOURCE

Paul Howard Scott, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 4, 1976, Ser. No. 738,778

Int. Cl.[2] H03K *19/08, 19/40*

U.S. Cl. 307—213 **6 Claims**



1. An injector gate for use with an integrated injection logic semiconductor circuit, comprising: an I^2L gate having an NPN

transistor with at least two collectors; means for providing a resistance, the means having a first and a second end; and an NPN transistor having a base, emitter, and collector, the base of the NPN transistor being coupled to one of the at least two collectors and the emitter being coupled to the first end of the means, the second end of the means being coupled to the other of the at least two collectors.

4,075,509

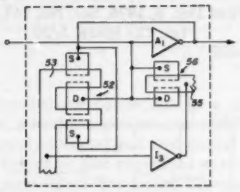
CMOS COMPARATOR CIRCUIT AND METHOD OF MANUFACTURE

Thomas P. Redfern, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 12, 1976, Ser. No. 731,269

Int. Cl.[2] H03K *17/60;* **H01L** *29/78, 27/08;* **H03K** *17/16*

U.S. Cl. 307—251 **3 Claims**



1. In a chopper stabilized amplifier including an amplifying section having input and output terminals, switch means coupled between said input and output terminals for periodically coupling said terminals together, and dummy transistor means for suppressing transient switching pulses produced at said input terminal by said switch means, means for combining said dummy transistor with said switch means whereby said transient suppression is rendered insensitive to gate alignment and lateral diffusion errors, said combination comprising:

dummy transistor means having source, gate and drain electrodes;

switch transistor means having a common drain electrode, a pair of source electrodes, and a pair of gate electrodes, each one of said pair of source electrodes having a length equal to the length of said dummy transistor source electrode and a spacing from said common drain electrode equal to the source to drain spacing in said dummy transistor;

means coupling said dummy transistor source and drain electrodes to said common drain electrode of said switch transistor means and means coupling said pair of gate electrodes of said switch transistor means together whereby said switch transistor means has an effective channel width of twice that of said dummy transistor means and said common drain electrode of said switch transistor means along with said source and drain of said dummy transistor means comprise a circuit node; and

means for switching said gate of said dummy transistor means in complementary fashion with said pair of gate electrodes of said switch transistor means whereby the switching transients at said circuit node cancel.

4,075,510

THYRISTOR VOLTAGE SWITCHING CIRCUITS

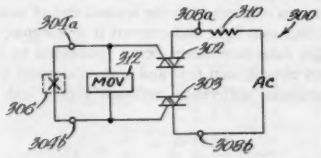
Joseph E. Pascente, 71 Regent Drive, Oak Brook, Ill. 60521

Filed Sept. 17, 1976, Ser. No. 724,326

Int. Cl.[2] H03K *17/72, 17/08*

U.S. Cl. 307—252 B **7 Claims**

1. In a voltage switching circuit, first and second semiconductor devices each having a pair of controlled electrodes, a control electrode for controlling conduction between said controlled electrodes, and a breakdown voltage rating between said controlled electrodes, one of said controlled electrodes of one said devices being connected with one of said controlled electrodes of the other said devices connecting said devices in series, the other controlled electrodes of said devices for being connected across a load and a source of voltage having a nominal value less than the combined value of said breakdown voltages, and means for sensing the voltage across said other controlled electrodes of said devices and for applying a signal to said control electrodes to establish conduction between said controlled electrodes of said devices whenever said voltage exceeds a predetermined value greater than said nominal value and less than the combined value of said breakdown voltages.



4,075,511

ELECTRONIC SWITCHES

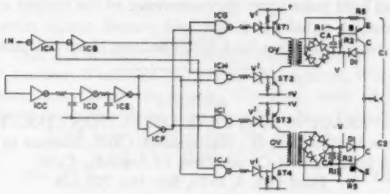
John Didwith Lewis, Braintree, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 19, 1976, Ser. No. 678,425

Claims priority, application United Kingdom, Apr. 18, 1975, 16083/75; July 22, 1975, 30657/75

Int. Cl.[2] H03K *17/00*

U.S. Cl. 307—270 **5 Claims**



1. An electronic switch for driving a load comprising: an input, means for producing a first pulsed d.c. input current of a certain value and for a period of time sufficient to permit current flow through the load and applying said pulsed current to said input, second means for producing a second holding current sufficient to supply leakage current to the load and applying said second holding current to said input, the said input having one side thereof connected to a reference voltage to which it is required to switch the load and having the other side thereof connected to the emitter of a transistor, with the base of the transistor driven from a potential divider disposed across the input and with the collector of the transistor connected to the load, and a diode connected between the collector of the transistor and the reference voltage so that, in operation, when the transistor conducts, current passes through the load until the output voltage is higher than the reference voltage, whereupon the output is clamped by the current flowing in the diode.

4,075,512

LIGHT PIPE TECHNIQUE FOR GRID PULSING

Gustaf J. Rast, Jr., and Thomas A. Barley, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

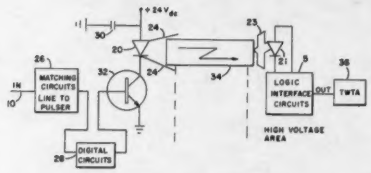
Filed Feb. 4, 1975, Ser. No. 546,969

Int. Cl.[2] H03K *17/00*

U.S. Cl. 307—311 **1 Claim**

1. In a coupling system having a first circuit which has an output signal which is to be coupled to an input of a second circuit the improvement comprising a light pipe connected

between said first and second circuits for coupling said signal; light emitting means connected to the output signal of said first circuit so as to emit light in response to the output signal of said first circuit; said light emitting means being located at a first end of said light pipe so as to allow the light emitted to pass through said light pipe to a second end of said light pipe; detector means connected to the second end of said light pipe so as to detect said light and convert it to a signal; the output of said light detecting means being connected to an input of said second circuit; said first and second circuits have a high voltage potential difference between them; said light pipe



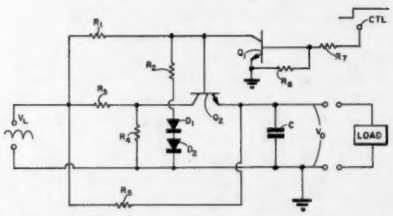
provides insulation between the circuits; said first circuit is at ground potential; said second circuit is operating at a high voltage with respect to the ground potential; said light emitting means is a light emitting diode; and said detecting means is a photodetector diode; said output signal is an electrical pulse; circuit means connected to said light emitting diode so as to cause said light emitting diode to emit a short light pulse as compared to the length of the pulse of the output signal upon the occurrence of the leading edge of said output signal and a second light pulse upon the occurrence of the trailing edge of said output signal pulse; and said second circuit converting these two light pulses back into one long electrical pulse.

4,075,513

AVERAGING AND PEAK DETECTION CIRCUIT

William L. Hinckley, Jr., Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 4, 1976, Ser. No. 729,226
Int. Cl.² H03K *5/20*
U.S. Cl. 307—350 **9 Claims**



1. In combination:

charge storing capacitance means;

input terminal means to receive an input signal;

output terminal means connected to said charge storing capacitance means and responsive to the charge stored thereon;

impedance means connected between said input terminal means and said charge storing capacitance means; and

a first multi-terminal semiconductor device having first and second conduction path electrodes connected between said input terminal means and said charge storing capacitance means;

said multi-terminal device having a control electrode for receiving a first driving signal from a source of reference potential to disable said device, whereby said capacitance means is charged by the input signal via said impedance means, some of the charge stored by said capacitance means periodically leaking therefrom so that said capacitance means is charged up in a relatively long interval of time; or

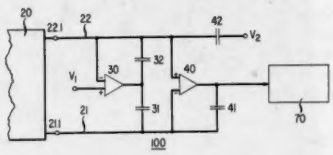
the control electrode of said multi-terminal device receiving a second driving signal from said input terminal means to enable said device, whereby said capacitance means is charged by the input signal via the conduction path of said device, said device adapted to be periodically rendered non-conductive as a function of said input signal so as to thereby substantially reduce the leakage of charge from said capacitance means so that said capacitance means is charged up in a relatively short interval of time.

4,075,514

SENSING CIRCUIT FOR SEMICONDUCTOR CHARGE TRANSFER DEVICES

Carlo Heinrich Sequin, Berkeley, Calif., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 6, 1976, Ser. No. 747,900
Int. Cl.² H03K *5/20*
U.S. Cl. 307—355 **26 Claims**



1. Semiconductor apparatus which comprises

(a) a charge transfer device for transferring charge in a semiconductor medium having first and second sets of sense electrodes, each said electrode located in proximity to a major surface of the medium for detecting the charge in the medium underlying each said electrode;

(b) conducting means for electrically connecting together all of the electrodes of the first set to a first output terminal of said device and for connecting together all of the electrodes of the second set to a second output terminal of said device, said device also including at least one other separate electrode connected to a first reference terminal for connection to a first D.C. voltage source;

(c) a first amplifier means, for suppressing common mode signals on the first and second sets of electrodes, having at least first and second input terminals of opposite summing polarity, said first input terminal being connected to said second output terminal of said device and said second input terminal being connected to said reference terminal for connection to the first D.C. voltage source, said first amplifier means having an output terminal electrically coupled through a feedback means to the second output terminal of said device; and

(d) first and second electrical capacitors, one of which is electrically connected for coupling said first output terminal of said device to an output terminal of the first amplifier, and the other of which is connected for coupling said output terminal of the first amplifier to said second output terminal of said device.

4,075,515

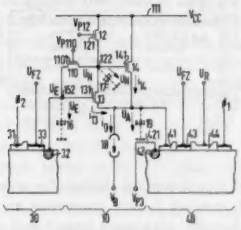
DIGITAL DIFFERENTIAL AMPLIFIER FOR CCD ARRANGEMENTS

Kurt Hoffmann, Taufkirchen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 25, 1976, Ser. No. 717,690
Claims priority, application Germany, Sept. 18, 1975, 2541721
Int. Cl.² H03K *5/18, 5/02;* H01L *29/78*
U.S. Cl. 307—362 **14 Claims**

1. A digital differential amplifier comprising a first voltage supply terminal and a second voltage supply terminal, an input terminal, an output terminal, a first transistor connected to said

input terminal via a first terminal of its source-drain-channel, said first transistor having a gate terminal for connection to a first control potential terminal, a first capacitance connected between said input terminal and said first voltage supply terminal, a circuit node point, a second transistor connected between said circuit node point and said output terminal, said second transistor having a gate connected to said input terminal, a third transistor connected between said second voltage supply terminal and said circuit node point, said third transistor



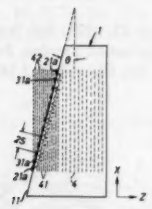
having a gate terminal for connection to a second control potential terminal, a fourth transistor connected between said second voltage supply terminal and said output terminal, said fourth transistor having its gate connected to said circuit node point, a second capacitance connected between said output terminal and said first voltage supply terminal, a third capacitance connected between said circuit node point and said first voltage supply terminal, a current sink connected between said output terminal and a third voltage supply terminal.

4,075,516

DIFFRACTION ELECTROACOUSTIC TRANSDUCER

Shuzo Hattori, and Tadao Hiramatsu, both of Nagoya, Japan, assignors to Hagiwara Denki Kabushiki Kaisha, Nagoya, Japan

Filed May 20, 1976, Ser. No. 688,358
Claims priority, application Japan, May 21, 1975, 50-61209
Int. Cl.[2] H01L *41/04*
U.S. Cl. 310—334 **4 Claims**



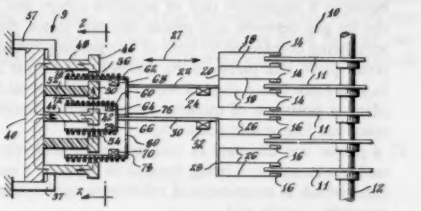
1. A diffraction electroacoustic transducer comprising:
a piezoelectric crystal;
a set of interdigital electrodes including a first plurality of metal strips and a second plurality of metal strips both provided on one surface of said crystal for producing an acoustic volume wave of a desired acoustic field within said crystal; and
means for applying an AC voltage to said interdigital electrodes;
said first plurality of metal strips of said interdigital electrodes positioned substantially along a first set of lines defined by the intersection of said one surface and a first set of equi-phase surfaces along a pre-specified wavefront defining the desired acoustic field; and said second plurality of metal strips of said interdigital electrodes positioned substantially along a second set of lines defined by the intersection of said one surface and a second set of equiphase surfaces shifted π radians from said first set of equiphase surfaces.

4,075,517

LINEAR ACTUATOR

David George Adler, Drexel Hill, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 2, 1976, Ser. No. 673,021
Int. Cl.[2] H02K *33/00*
U.S. Cl. 310—13 **14 Claims**



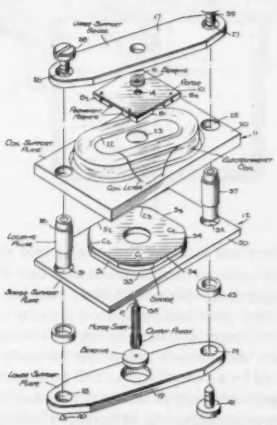
1. An electromagnetic linear actuator comprising:
magnetic means providing a magnetic circuit having a plurality of annular, concentrically located air gaps in said circuit;
a plurality of annular actuator forms, each of said forms having a longitudinal axis and each form positioned in one of said air gaps; and
a plurality of actuator windings, each of said windings mounted on an actuator form and adapted, when electrically energized, to establish an electromagnetic field which reacts with a field of the magnetic circuit and cause rectilinear motion of the associated form in the direction of the longitudinal axis.

4,075,518

MICRO-MINIATURE STEPPING MOTOR

Dale R. Koehler, Westwood, N.J.; Robert F. Sagarino, Wheatley Heights, and Charles A. Sauter, Westbury, both of N.Y., assignors to Bulova Watch Company, Inc., New York, N.Y.

Filed June 22, 1976, Ser. No. 698,506
Int. Cl.[2] H02K *37/00*
U.S. Cl. 310—49 R **11 Claims**



1. A stepping motor for driving the gear train of a watch movement, said motor comprising:
A. a rotor formed by a plate mounted on a shaft passing through its center, and a set of four like permanent magnet pieces attached to the underside of the plate at positions corresponding to the corners of a square whose diagonals intersect said center, the magnetic poles of said pieces being in mutual opposition;
B. a generally square stator plate disposed in parallel relation

to said rotor plate to define an air gap therebetween, said stator plate having a central opening through which said shaft extends, said plates both being formed of ferromagnetic material, thereby creating, when the pieces of the rotor are aligned with the corner of the stator plate, a symmetrical magnetic circuit of four flux loops, each loop having lines of flux which pass through said rotor plate between a respective pair of adjacent pieces and bridge the air gap between said pieces and said stator plate, the loop being completed by lines of flux passing through said stator plate, said pieces in the absence of a torque applied to said rotor being aligned with the corners of said stator plate at positions of minimum reluctance, whereby said rotor has four stable positions;

C. a planar coil disposed in said gap in parallel relation to said plates, said coil being formed to produce a magnetic field which is asymmetrical relative to said symmetrical magnetic circuit; and

D. means to apply an electrical impulse to said coil to produce said asymmetrical magnetic field to cause said rotor to step from one stable position to the next.

4,075,519

BRUSHLESS ALTERNATOR

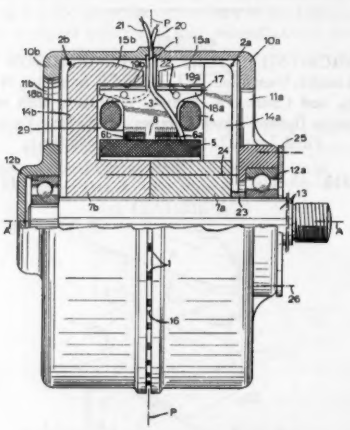
Ivan Mrcun, Kajuhova 4, Domzale, Yugoslavia (61230)

Filed Oct. 22, 1975, Ser. No. 624,934

Claims priority, application Yugoslavia, Nov. 22, 1974, 2819/74; Nov. 22, 1974, 2820/74

Int. Cl.[2] H02K *7/00*

U.S. Cl. 310—67 R **10 Claims**



1. In an electrical machine comprising two relatively rotatable members centered on a common axis, one of said members having a magnetically permeable body which includes a magnetized hub and two axially spaced annular arrays of pole pieces rigid with opposite extremities of said hub, the other of said members including a set of peripherally spaced teeth interconnected by an annular yoke and positioned for magnetic interaction with said pole pieces, said yoke and said teeth being magnetically permeable, and armature windings surrounding said teeth, the pole pieces of one array having substantially axially extending faces on one side of a transverse midplane and being peripherally offset from the oppositely polarized pole pieces of the other array, the latter having substantially axially extending faces on the other side of said midplane,

the improvement wherein said teeth are generally T-shaped in an axial plane with a stem passing radially along said midplane between said arrays and with an axially extending cross-bar positioned to pass close by said faces upon relative rotation of said members.

4,075,520

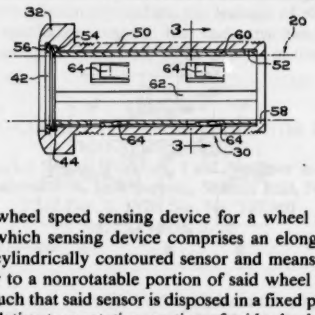
WHEEL SPEED SENSOR

David Larry Davy, Sr., Troy, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 6, 1976, Ser. No. 683,694

Int. Cl.[2] H02K *19/24*

U.S. Cl. 310—168 **4 Claims**



1. In a wheel speed sensing device for a wheel and brake assembly which sensing device comprises an elongated, substantially cylindrically contoured sensor and means to mount said sensor to a nonrotatable portion of said wheel and brake assembly such that said sensor is disposed in a fixed preselected position relative to a rotating portion of said wheel and brake assembly, the improvement wherein said mounting means comprises

A. an outer annular housing having a central bore extending therethrough of sufficient size to receive said sensor;

B. a longitudinally split, spring-like tubular sleeve disposed within said housing bore and substantially surrounding and engaging said sensor with a radially inwardly directed spring force, said sleeve having restraining means associated therewith to resist rotational movement of said sleeve relative to said housing bore, and

C. means to lock said sleeve against axial movement relative to said housing.

4,075,521

MULTI-PHASE GENERATOR WITHOUT SLIP RINGS AND BRUSHES

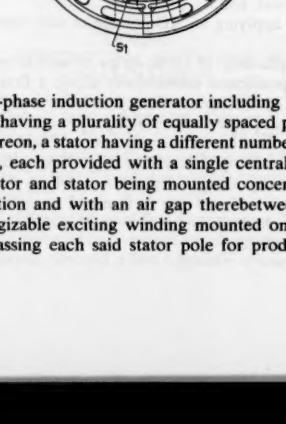
Knut Assar Nordebo, Ringvagen 28, Haparanda, Sweden (S-953 00)

Filed May 27, 1976, Ser. No. 690,597

Claims priority, application Sweden, June 6, 1975, 7506491

Int. Cl.[2] H02K *3/00*

U.S. Cl. 310—184 **1 Claim**



1. A multi-phase induction generator including in combination, a rotor having a plurality of equally spaced poles but no windings thereon, a stator having a different number of equally spaced poles, each provided with a single centrally disposed slot, said motor and stator being mounted concentrically for relative rotation and with an air gap therebetween, a direct current energizable exciting winding mounted on said stator and encompassing each said stator pole for producing mag-

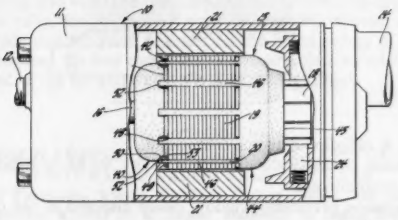
netic flux of the opposite sense in adjacent stator poles, and a multi-phase alternating current output winding mounted on said stator with the phase windings located respectively in the centrally disposed slots of adjacent stator poles, thereby to achieve a mutual displacement of half a pole pitch between said exciting winding and said multi-phase output winding, said multi-phase output winding producing a multi-phase output voltage between beginning and end terminals of each stator phase winding, the number of stator poles being equal to m.p, the number of rotor poles being equal to m(p±1), *m* being an integer factor **1, 2, 3,** . . . , and *p* being an even integer factor **2, 4, 6,** . . . , an additional multi-phase alternating current winding mounted on said stator and having a coil pitch of about half the coil pitch of the said multi-phase output winding, said additional multi-phase winding having phase windings located in an additional pair of slots of each stator pole, said additional pair of slots being symmetrically disposed in relation to the central slot of each stator pole, the phase windings of said additional multi-phase winding being connected in series with those phase windings of said multi-phase output winding in which voltage occurs substantially simultaneously.

4,075,522

SELF CLAMPING ARMATURE CASING FOR AN ELECTRIC MOTOR DRIVEN FLUID PUMP

Robert P. Hoffman, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 16, 1976, Ser. No. 714,382
Int. Cl.[2] H02K *3/48*
U.S. Cl. 310—214 **1 Claim**



1. In an armature of an electric motor driven pump, the armature being adapted for rotation within a fluid medium and including a core with axially extending slots, a winding comprising conductors disposed in the slots and end turns disposed across the opposite axial ends of said core, and two part casing means enclosing the core, conductors and end turns for reducing armature induced fluid turbulence, the casing means comprising first and second end caps covering the end turns at opposite axial ends of the core, the first end cap having a plurality of integral axially extending fingers slidably disposed respectively in the core slots, the armature further having means wedging the fingers in the slots against radial outward movement, the improvement comprising, in combination:

an outwardly extending circumferential flange on the second end cap adjacent the axial ends of the core slots; and

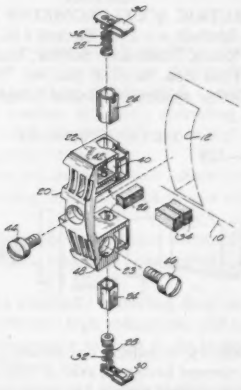
a plurality of hooks, one on the end of each finger, adapted to engage a side of the flange to clamp the first and second end caps to each other for retention on the armature, each hook having a ramp surface sloping radially inward from the end of the finger, the ramp surface being cooperative with the flange, upon axial movement of the fingers during assembly, to force the respective hook radially outward over the flange into locking engagement therewith.

4,075,523

PLUG-IN BRUSH CARTRIDGE

Gary S. Lafferty, Sr., Franklin, Wis., assignor to Milwaukee Electric Tool Corporation, Brookfield, Wis.

Filed Sept. 2, 1975, Ser. No. 609,237
Int. Cl.[2] H02K *13/00*
U.S. Cl. 310—239 **7 Claims**



1. A plug-in cartridge adapted for insertion into a cartridge receiving opening in only one side of a motor housing forming part of a pistol handle type of power tool and containing an electric motor and its commutator for a power operated tool comprising:

(a) a motor housing having a cartridge receiving opening in one side thereof in juxtaposition to the commutator on the electric motor;

(b) a plug-in cartridge slidably received and seated in said cartridge receiving opening, said cartridge supporting at least two carbon brush assemblies each having an active carbon brush, said brushes being positioned to slide radially onto and engage the commutator from diametrically opposed positions; and

(c) terminal means in said opening and on said plug-in cartridge adapted to make and break electrical contacts as said cartridge is moved into or out of said opening.

4,075,524

BRUSH SHUNT CONNECTION

Elmo F. Bradshaw, and John F. Rakszawski, both of St. Marys, Pa., assignors to Airco, Inc., Montvale, N.J.

Filed July 1, 1976, Ser. No. 701,471

Int. Cl.[2] H01R *39/6*

U.S. Cl. 310—249 **5 Claims**

1. A tamping material for securing electrical connections to carbon blocks comprising free-flowing granules each consisting essentially of 85% to 97% by weight graphite particles and 15% to 3% by weight of polyaryl sulfone resin as a binder.

4,075,525

PIEZOELECTRIC ACCELEROMETER TRANSDUCER

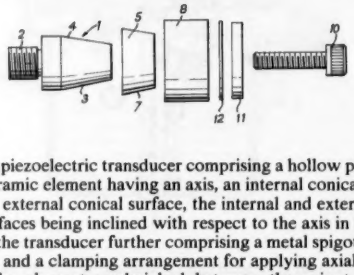
Donald Jack Birchall, c/o D. J. Birchall Ltd., Finchley Avenue, Industrial Estate, Mildenhall, Suffolk, England

Filed Dec. 14, 1976, Ser. No. 750,415

Claims priority, application United Kingdom, Jan. 5, 1976, 241/76

Int. Cl.[2] H01L *41/04*

U.S. Cl. 310—329 **6 Claims**



1. A piezoelectric transducer comprising a hollow piezoelectric ceramic element having an axis, an internal conical surface and an external conical surface, the internal and external conical surfaces being inclined with respect to the axis in the same sense; the transducer further comprising a metal spigot; a metal sleeve; and a clamping arrangement for applying axial force to hold the element sandwiched between the spigot and the sleeve, the spigot and the sleeve having conical surfaces which make intimate surface contact with the internal and external conical surfaces of the element respectively.

4,075,526

HOT-CATHODE X-RAY TUBE HAVING AN END-MOUNTED ANODE

Bernard Grubis, Paris, France, assignor to Compagnie Generale de Radiologie, Paris, France

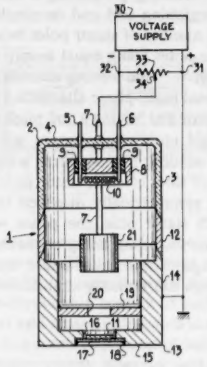
Filed Nov. 5, 1976, Ser. No. 739,178

Claims priority, application France, Nov. 28, 1975, 75 36607

Int. Cl.[2] H01J *35/14*

U.S. Cl. 313—56 **18 Claims**

1. An X-ray tube of the type having a hot cathode at one end, a main anode in the form of a metal plate perpendicular to the axis of the electron beam located at the other end thereof, said beam bombarding the main anode so that at least part of the useful X-ray beam generated by this bombardment passes through the thickness of the main anode, which acts as a filter for the emitted X-ray beam by allowing the characteristic radiation of the material forming the main anode to pass therethrough preferentially, further comprising: an annular secondary anode provided with a central opening arranged in the path of the electron beam, near the main anode and coaxial



thereto, said secondary anode being at the same electrical potential as the main anode and having at least its surface made of the same metal as the main anode, thereby adding to the characteristic radiation from the main anode, a supplementary characteristic radiation resulting from electrons which are back-scattered due to elastic collisions with the atoms of the main anode and which strike the secondary anode.

4,075,527

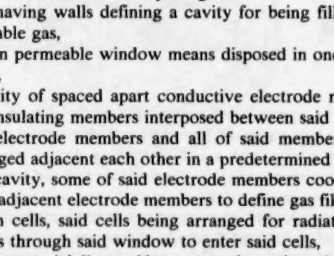
X-RAY DETECTOR

Harold R. Cummings, Waukesha, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Sept. 27, 1976, Ser. No. 727,260

Int. Cl.[2] B32B *31/20*; H01J *1/90, 39/26*

U.S. Cl. 313—93 **23 Claims**



1. A radiation detector comprising:

means having walls defining a cavity for being filled with ionizable gas,

radiation permeable window means disposed in one of said walls,

a plurality of spaced apart conductive electrode members and insulating members interposed between said conductive electrode members and all of said members being arranged adjacent each other in a predetermined order in said cavity, some of said electrode members cooperating with adjacent electrode members to define gas filled ionization cells, said cells being arranged for radiation that passes through said window to enter said cells,

adhesive material disposed between and on selected adjacent portions of said members, said adhesive material being deposited on limited areas of said members and with sufficient thickness to space said members nonuniformly initially, said adhesive material having the property of yielding when said members are arranged and subjected to

compression to thereby establish the desired total thickness and interspacing dimensions of said plurality of members and having the property of subsequently solidifying to bond said members together and thereby maintain said dimensions.

4,075,528

XENON LAMP WITH MAGNETS ON THE ELECTRODES

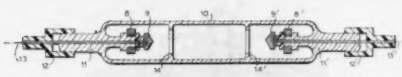
Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan

Filed Mar. 15, 1977, Ser. No. 777,938

The portion of the term of this patent subsequent to Nov. 9, 1993, has been disclaimed.

Int. Cl.[2] H01J *1/50, 61/16*

U.S. Cl. 313—154 **2 Claims**



1. A xenon lamp comprising a transparent tube, and electrode structure at each end of said tube including an electrode extending into said tube and sealing said electrode into the end of said tube, and an open ring magnet around each electrode structure and mounted on the electrode structure between the free end of the electrode within the tube and the end of the tube in which the electrode is sealed.

4,075,529

XENON LAMP CONTAINING MAGNETIC ADSORBERS INSIDE THE TUBE THEREOF

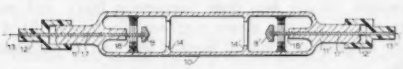
Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan

Filed Mar. 18, 1977, Ser. No. 779,225

The portion of the term of this patent subsequent to Nov. 9, 1993, has been disclaimed.

Int. Cl.[2] H01J *1/50, 61/16*

U.S. Cl. 313—154 **5 Claims**



1. A xenon lamp comprising a transparent tube, and electrode structure at each end of said tube including an electrode extending into said tube and sealing said electrode into the end of said tube, and an annular magnetic absorber around each electrode structure and mounted on the inner surface of said tube between the free end of the electrode within the tube and the end of the tube in which the electrode is sealed.

4,075,530

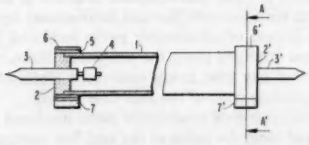
HIGH PRESSURE SODIUM VAPOR LAMP OF UNSATURATED VAPOR PRESSURE TYPE

Haruo Furukubo, Kyoto; Yasaburo Takezi, Shiga, and Kenzi Takatuka, Kyoto, all of Japan, assignors to Japan Storage Battery Company Limited, Kyoto, Japan

Filed Apr. 21, 1976, Ser. No. 679,288

Int. Cl.[2] H01J *61/20, 61/22, 61/30*

U.S. Cl. 313—229 **5 Claims**



1. In a sodium vapor electric discharge lamp of the type having an arc tube made of a heat-resistant and light transmissive tubular body with sodium, mercury and a starting gas therein, the improvement characterized by the amounts of said sodium and said mercury being in the ranges of 0.007 to 0.054 mg and 0.054 to 0.6 mg, respectively, for every cubic centimeter of the volume of said arc tube, whereby all of the filled sodium and mercury are vaporized when operated.

4,075,531

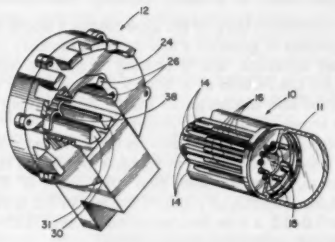
BASE-SOCKET SYSTEM WITH ARC PREVENTION MEANS

Armando V. Marino, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jan. 3, 1977, Ser. No. 756,204

Int. Cl.[2] H01J *17/00*

U.S. Cl. 313—325 **2 Claims**



1. An axially compact and highly arc protective base-socket system for use with a color television picture tube having a narrow neck terminated by a cylindrical coaxial tubulation surrounded by a number of axially extending, electrically conductive low voltage pins and at least one high voltage pin, said base-socket system comprising:

a base fitting over and secured to said tubulation and passing said pins extending from said neck of said tube, said base comprising:

a plurality of axially and radially outwardly extending insulating walls, said low voltage pins lying between said walls,

means defining an axially extending deep narrow cavity which receives said high voltage pin, said cavity having a depth at least twice as great as the largest transverse dimension thereof, and

a cavity lip surrounding a mouth of said cavity;

a socket comprising:

an annular support means defining a series of axially and radially inwardly extending channels for mating with said insulating walls on said base to unambiguously orient said base relative to said socket,

a series of contacts on said annular support means for establishing electrical connection with said plurality of low voltage pins on said base when said base is inserted into said socket,

an axially extending socket protrusion for mating with said axially extending deep narrow cavity,

a high voltage contact in said socket protrusion for establishing electrical connection with said high voltage pin on said base when said base is inserted into said socket,

a cap having an annular arc-path-length-extending flange which externally telescopes over said cavity lip,

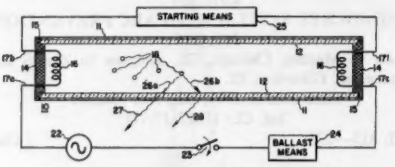
whereby when said base and socket are connected, the mating of said socket protrusion and flange with said base cavity and lip form multiply folded extended arc path lengths providing a very high degree of arc protection in an axially compact system.

4,075,532

COOL-WHITE FLUORESCENT LAMP WITH PHOSPHOR HAVING MODIFIED SPECTRAL ENERGY DISTRIBUTION TO IMPROVE LUMINOSITY THEREOF

William W. Piper, Scotia; Jerome S. Prener, Schenectady, both of N.Y., and George R. Gillooly, Cleveland Heights, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed June 14, 1976, Ser. No. 695,934
Int. Cl.[2] H01J *61/44;* C09K *11/12, 11/24, 11/42*
U.S. Cl. 313—497 8 Claims



1. In a fluorescent lamp of the type having a sealed envelope enclosing means to generate a low-pressure mercury discharge within said envelope, and a coating contained within said envelope for conversion of at least a portion of the radiation emitted from said discharge to visible light having a white color, the improved coating comprising:

a first phosphor having a relatively broad emission spectrum with a mean wavelength in a yellow portion of the visible spectrum, wherein said first phosphor is $Ca_{10-w-x-y}Cd_wMn_xSb_y(PO_4)_6F_{2-y}O_y$ where w is in the approximate range 0.0–0.2, x is in the approximate range 0.25–0.50 and y is in the approximate range 0.02–0.2;

a second phosphor having a relatively narrow emission spectrum in a blue portion of the visible spectrum;

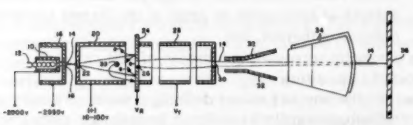
said first and second phosphors being uniformly blended together in a porportional relationship preselected to provide increased luminous efficacy for said mixture.

4,075,533

ELECTRON BEAM FORMING STRUCTURE UTILIZING AN ION TRAP

Bozidar Janko, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sept. 7, 1976, Ser. No. 720,858
Int. Cl.[2] H01J *29/56*
U.S. Cl. 315—31 R 5 Claims



1. An electron discharge device in which the improvement comprises an electron beam-forming structure including:

a cathode having a negative potential connected thereto for emitting an electron beam;

a grid electrode adjacent said cathode including an aperture through which said electron beam passes, said grid electrode having a negative potential connected thereto slightly larger than the cathode potential; anode means disposed adjacent to said grid electrode including a first section having a beam-admitting aperture for admitting the electron beam from said grid electrode into said anode means and a second section having a beam-limiting aperture for limiting the electron beam as it passes therethrough, said second section being connected to a reference potential;

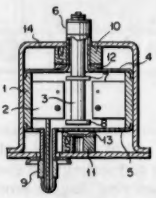
and positive bias means connected to said first section of said anode to repel positive ions away from said beam-admitting aperture as said positive ions approach said beam-admitting aperture to prevent said positive ions from reaching said cathode.

4,075,534

MAGNETRON WITH HOLDING MEANS TO SUPPORT A PAIR OF PERMANENT MAGNETS

Hisao Saito; Norio Tashiro, both of Yokohama, and Tokuju Koinuma, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 25, 1976, Ser. No. 717,689
Claims priority, application Japan, Sept. 1, 1975, 50-104968
Int. Cl.[2] H01J *25/50*
U.S. Cl. 315—39.71 10 Claims



1. A magnetron comprising a main magnetron body including an anode cylinder formed interiorly with resonance cavities, a cathode member disposed along the central axis of said anode cylinder, and anode cylinder seal means made of non-magnetic material, for hermetically sealing openings at both ends of said anode cylinder, microwave output means connected to said resonance cavities in said anode cylinder, for transmitting microwaves generated from said resonance cavities outside said main magnetron body, a pair of permanent magnets disposed outside the main magnetron body in a manner opposing said anode cylinder seal means to produce a magnetic field in the axial direction of said anode cylinder, a yoke for magnetically mutually coupling said pair of permanent magnets outside said main magnetron body, and main magnetron body holding means mechanically reliably fixed to said main magnetron body, to support said pair of permanent magnets.

4,075,535

FLAT CATHODIC TUBE DISPLAY

Pierre Genequand, Geneva, and Didier Joyeux, Petit-Lancy, both of Switzerland, assignors to Battelle Memorial Institute, Switzerland

Filed Apr. 13, 1976, Ser. No. 676,492
Claims priority, application Switzerland, Apr. 15, 1975, 4764/75; Apr. 15, 1975, 4766/75
Int. Cl.[2] H01J *29/50, 31/10*
U.S. Cl. 313—422 14 Claims

1. Video cathode tube intended for the restitution in visible form of electric signals representing an image, comprising an air-free enclosure defined by a wall a portion of which constitutes a transparent window, said enclosure containing:

a. a layer of at least one luminescent substance carried by a transparent plate, this layer having a size substantially equal to that of said window and being visible through it;

b. a matrix of field effect emitters of low emission threshold distributed in rows and columns, oriented in such a manner as to emit towards the said luminescent layer;

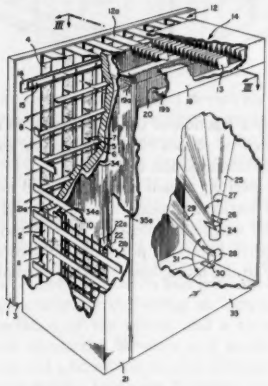
c. a first system of conductive paths insulated from each other and arranged along the rows of emitters, each of the emitters of any row being connected electrically to the corresponding path of the said first system;

d. a second system of conductive paths insulated from each other and from the paths of the said first system, disposed in contact with said luminescent layer and extending in front of the columns of emitters;

e. a first energizing device comprising a first bank of contacts connected individually to the paths of said first system at one end of them, and a first means for sequentially bringing the contacts of said first bank to a first potential;

f. a second energizing device comprising a second bank of contacts connected individually to the paths of said second system, at one end of them, and a second means for sequentially bringing the contacts of said second bank to a second potential;

g. and a control electrode in the form of a grid connected to a source of voltage interposed between said matrix of emitters and said second system of conductive paths and having substantially the same length as them, the selection of the voltage of said source and of said second potential



with respect to the said first potential being such that at the intersection of the paths brought respectively to said first and second potentials there prevails, simultaneously, in the immediate vicinity of the end of the emitter located at said intersection a low voltage drop which is sufficient to cause the emission by field effect of electrons from said emitter and in the vicinity of the portion of luminescent layer located at said intersection a high potential drop capable of imparting to the electrons emitted sufficient energy to excite said luminescent layer portion, the said first or second energizing devices being modulated by the said signals in such a manner that said luminescent layer portion is illuminated as a function of the said signals, the group of luminous points thus obtained sequentially constituting the said image.

4,075,536

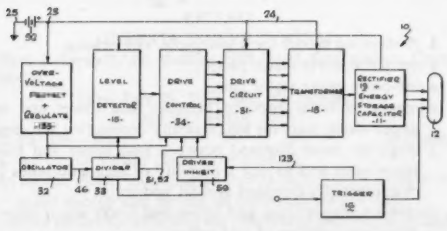
CAPACITOR CHARGING SYSTEM

Carlile R. Stevens, 468 El Rio Road, Danville, Calif. 94526

Filed July 28, 1976, Ser. No. 708,851

Int. Cl.[2] H05B *41/32*; H02J *15/00*

U.S. Cl. 315—241 P **3 Claims**



1. A system for charging an energy storage capacitor to a selected voltage level, comprising:

a transformer having a tapped primary winding and a secondary winding;

a rectifier connected to said secondary winding to rectify the output of said transformer, said rectified output being supplied to said energy storage capacitor;

at least two pairs of drivers connected to different taps of said primary winding, each pair of drivers being alternately switched on and off to provide an alternating input to said transformer;

level detector means, responsive to the voltage across said energy storage capacitor, for sequentially enabling different pairs of said drivers as the voltage across said energy storage capacitor reaches progressively higher preselected values, said enabled pairs of drivers providing an input to progressively decreasing portions of said transformer primary winding so that a corresponding larger voltage output, at lower current, is supplied via said secondary winding and rectifier to said energy storage capacitor;

said transformer primary winding is center-tapped, one polarity terminal of a voltage source being connected to said center tap, each pair of drivers comprising first and second drive transistors respectively connected to apply voltage from the other polarity terminal of said source to a respective primary winding tap on opposite sides of said center-tap, said system further comprising;

alternation means for periodically, alternately turning on one drive transistor and turning off the other drive transistor in an enabled pair of drivers;

said alternation means comprises:

an oscillator;

a counter, said counter having alternating output signals, and

circuit means connecting said alternating output signals to said drivers alternately to enable the drive transistors in each pair.

4,075,537

IGNITION ELECTRODE ARRANGEMENT FOR GAS DISCHARGE LAMPS, PARTICULARLY FOR FLASH TUBES

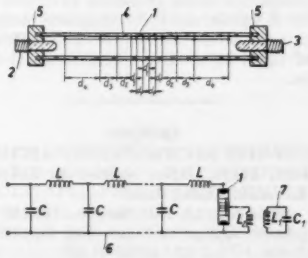
Winfried Quillfeldt, Jena, Germany, assignor to Jenoptik Jena G.m.b.H., Jena, Germany

Filed Oct. 13, 1976, Ser. No. 731,499

Claims priority, application Germany, Dec. 16, 1975, 190180

Int. Cl.[2] H05B *41/22, 41/32*

U.S. Cl. 315—354 **1 Claim**



1. An electrode arrangement for improving the ignition readiness of gas discharge lamps, particularly of flash tubes comprising

a gas discharge tube, being filled with a rare gas,

at least two electrodes, either of said electrodes being provided at the end portions of said tube,

a plurality of wire loops surrounding the surface of said tube,

a current supply unit, connected to said electrodes, and to said wire loops

said wire loops being employed as ignition electrode,

said wire loops being mutually spaced from one another at

a distance which is smaller in the center portion of said tube than towards said end portions,

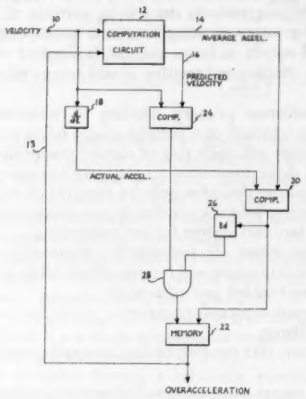
said current supply unit feeding ignition pulses into said wire loops.

4,075,538

ADAPTIVE ACCELERATION RESPONSIVE SYSTEM

Allan Barr Plunkett, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed May 19, 1976, Ser. No. 687,832
Int. Cl.[2] H02P *5/06*
U.S. Cl. 318—52 **22 Claims**



1. A system for detecting a change in acceleration of a moving object, which change exceeds a predetermined margin, said system comprising:

a. means for sensing the instantaneous velocity of said object and for developing a first signal representative of said velocity;

b. computation means connected to receive said first signal, said computation means being operable upon said first signal to produce a second signal representative of the average acceleration of said object and to produce a third signal representative of a predicted velocity of said object;

c. differentiator means connected to receive said first signal and responsive thereto to produce a fourth signal representative of the actual acceleration of said object; and

d. first comparison means connected to receive said second and fourth signals, said first comparison means providing a fifth signal when said fourth signal differs from said second signal by at least a predetermined acceleration margin.

4,075,539

STEP-BY-STEP RECIPROCATING MECHANISM

Tasaku Wada, Tokyo, Japan, assignor to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

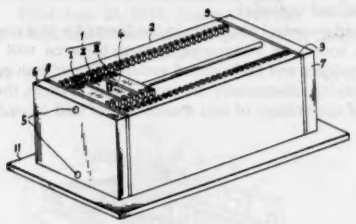
Filed Aug. 13, 1976, Ser. No. 714,245
Claims priority, application Japan, Aug. 15, 1975, 50-99362
Int. Cl.[2] H02K *41/00*
U.S. Cl. 318—135 **4 Claims**

1. A step-by-step reciprocating mechanism comprising:

a movable member having a plurality of magnetic pole sets each for a respective phase of a multiphase exciting current and disposed one above another;

guide means coupled to said movable member for guiding the movable member to travel along a straight guide path in a forward direction and in a reverse direction;

stationary magnetic pole means magnetically coupled to said movable member for developing an equal number of lines of magnetic poles disposed one above another at both sides of the straight guide path, each of said lines of magnetic poles having a number of fixed magnetic poles which are successively arranged with the same pitch so as to successively oppose the poles of the movable member when the movable member travels along the straight guide path, said magnetic poles of one magnetic pole set of said movable member and a respective line of magnetic poles of said stationary means being successively displaced by a fraction of the pitch equal to the fraction of the number of phases of the multiphase exciting current one phase corresponds; and



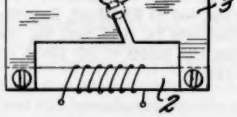
multiphase exciting means coupled to said moving member and said stationary means for successively magnetizing respective magnetic poles sets of said movable member and respective lines of poles of said stationary means in response to the multiphase exciting current.

4,075,540

STEPPING MOTOR FOR TIMEPIECE

Akira Torisawa, Machida, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed July 15, 1976, Ser. No. 705,441
Claims priority, application Japan, July 15, 1975, 50-87115; July 17, 1975, 50-88022; July 18, 1975, 50-881110
Int. Cl.[2] H02K *29/00*
U.S. Cl. 318—138 **6 Claims**



1. A stepping motor for a timepiece, comprising:

a one-piece lower stator pair;

a one-piece upper stator pair;

magnetic material disposed between said lower and said upper stator pairs for magnetically connecting the same;

a magnetic rotor disposed between said upper and lower stator pairs and having a plurality of magnetic poles circumferentially disposed around said rotor;

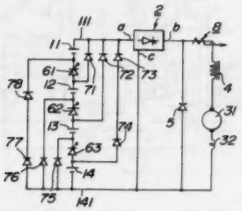
means for magnetizing said upper and lower stator pairs to effectuate rotation of said rotor;

and means for defining a rest position of said rotor when said upper and lower stator pairs are not magnetized.

4,075,541
DIRECT CURRENT MOTOR CONTROL DEVICE FOR USE IN BATTERY AUTOMOBILES

Takanori Shibata, and Katsuji Marumoto, both of Hitachi, Japan, assignors to Keishin Matsumoto, Tokyo, Japan

Filed Dec. 12, 1973, Ser. No. 426,650
Claims priority, application Japan, Dec. 15, 1972, 47-125240
Int. Cl. H02p 5/00
U.S. Cl. 318—139 1 Claim



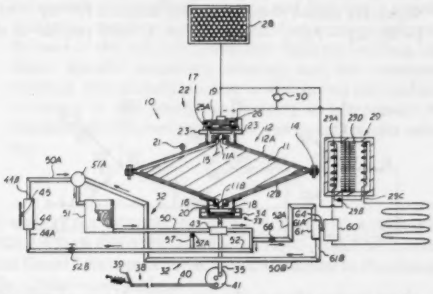
1. In a direct current motor control device for use in a battery-powered automobile having a direct current motor and a plurality of battery groups for supplying a direct current to said motor, a battery change-over thyristor circuit including a chopper circuit for changing over said battery groups from series connection to parallel connection and vice versa with respect to said motor, an accelerator signal generator connected to an accelerator pedal for delivering an output voltage in response to the operation of the accelerator pedal, a current detector circuit connected between said motor and said accelerator signal generator for delivering an output voltage in response to operation of the motor, and a turn-over signal generator circuit connected between said accelerator signal generator circuit and said motor current detector circuit and connected to said battery turn-over thyristor circuit for controlling said series-parallel change-over operation of said battery change-over thyristor circuit when the deviation between the output from said current detector circuit and the output from said accelerator signal generator circuit arrives at a predetermined value, the improvement comprising a αmax detector circuit connected to a common junction point between said current detector circuit and said accelerator signal generator circuit and said change-over signal generator circuit for detecting a predetermined maximum value in response to said deviation between the output from said current detector circuit and the output from said accelerator signal generator circuit to produce a step-up signal, and an αmin detector connected to the common junction point between said current detector circuit and said accelerator signal generator circuit on the one hand, and to said change-over signal generator circuit on the other hand, and for detecting a predetermined minimum value in response to said deviation between the output from said current detector circuit and the output from said accelerator signal generator circuit to produce a step-down signal, whereby said battery turn-over signal generator circuit becomes operated in response to the output signals from said αmax and αmin detector circuits.

4,075,542
INERTIA POWER SYSTEM

Robert J. Szegedy, 13 Mallory Hill Road, Georgetown, Conn. 06829

Filed July 29, 1975, Ser. No. 600,062
Int. Cl.[2] H02K 7/02
U.S. Cl. 318—161 6 Claims

1. An inertia power system comprising:
an inertia means including an inertia wheel for storing rotational energy and having an input and output end,
a drive means for effecting the rotation of said inertia wheel, operatively associated with the input end,
said drive means comprising an input magnet having a north and south pole journalled to said inertia wheel to rotate therewith,
a plurality of serially energized electromagnets circumferentially spaced about said input magnet so as to be opposite the poles of said magnet,
a second magnet rotatably mounted so as to be under the influence of said first magnet,
said second magnet having a field which is substantially less than the field of said input magnet,
spaced commutator stator stations operatively associated with said second magnet,
a terminal contact,
said electromagnets having windings connected between the associated commutator stator sections and said terminal contact,
and said second magnet having its poles oppositely disposed relative to the poles of said input magnet,



and a brush carried on one of the poles of said second magnet so as to electrically contact said commutator stator sections,
and a source of electrical energy for serially energizing said electromagnets whereby the developed field effects the rotation of said input magnet which imparts rotation to said inertia wheel and said second magnet,
and including a clutch means having;
an output magnet connected to the output end of said inertia wheel to rotate therewith,
a complementary clutch member moveably mounted relative to said output magnet,
said complementary clutch member including a plurality of magnets adapted to lock and unlock onto said output magnet as said complementary member is moved relative thereto,
and means for actuating said complementary clutch member.

4,075,543
METHOD OF DETERMINING THE POSITION AND CONNECTION OF MULTI-POLE WINDINGS FOR MULTI-SPEED ELECTRIC MACHINES

Thuy Nguyen Uyen, Grenoble, France, assignor to Anvar Agence Nationale de Valorisation de la Recherche, France

Continuation of Ser. No. 496,249, Aug. 9, 1974, abandoned. This application Apr. 29, 1976, Ser. No. 681,636
Claims priority, application France, Aug. 17, 1973, 73 30390
Int. Cl.[2] H02K 3/00
U.S. Cl. 318—224 R 7 Claims

1. A method of modifying a one-speed machine, wherein the elementary coils are arranged to provide a 2 p pole machine, into a two-speed machine having $2|p \pm q|$ poles at the other speed, and having an optimum efficiency at both speeds, using only two 3-phased switches, comprising the steps of:
choosing a base winding wherein the elementary coils are arranged to provide a 2 p pole machine;

dividing the length of the base winding along the air gap into 6 q sectors;

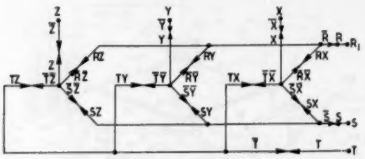
bringing the middle of any one of said 6 q sectors into the best coincidence possible with the middle of any one of the poles of any phase of said

2 p pole winding and denoting this sector as the first sector;

choosing an arbitrary positive direction for the pole and sector series:

referencing the elementary coils of said first sector for connection to the same phase in the 2 p pole configuration as in the $2|p \pm q|$ pole configuration;

assigning sector designations 2 to 6 to the sectors following said first sector in the positive direction, and referencing the elementary coils of sectors 2 to 6 for connection in phases which are shifted respectively for sectors 2 to 6 by $(\pi/6)$, $(2\pi/6)$, $(3\pi/6)$, $(4\pi,6)$, $(5\pi/6)$ with respect to the phase feeding them in the 2 p pole configuration in the case of the $2|p - q|$ pole configuration, and in phases which are shifted respectively for sectors 2 to 6 by $-\pi/6$, $(-2\pi/6,)$ $-3\pi/6$, $-4\pi/6$, $-5\pi/6$, with respect to the



phase feeding them in the case of the $2|p + q|$ pole configuration;

referencing the elementary coils for each of the q successive groups of 6 sectors for connection the same as is recited above; in the $2|p \pm q|$ pole winding thus determined, eliminating the elementary coils which are detrimental to the winding symmetry, whereby a winding is obtained which has 3 phases which are mutually phase-shifted by exactly 120° and which each comprise the same number of elementary coils;

connecting all of the elementary coils remaining after said elimination of said coils detrimental to winding symmetry in a circuit comprising three parallel stars, the ends of which are supplied through a first three-phase switch by three corresponding phases of the power supply source for operation at one of said speeds when said first switch is activated, the middle points of the star arms being respectively short-circuited for each phase and supplied through a second three-phase switch by three corresponding phases of said power supply source for operation at the other of said speeds when said second switch is activated.

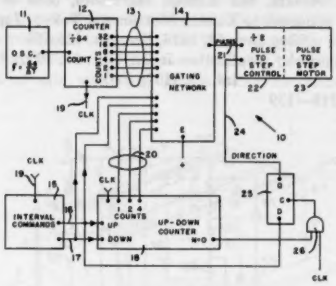
4,075,544

LINEAR VELOCITY CHANGE STEPPING MOTOR CIRCUIT

Albert C. Leenhouts, Harwinton, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Oct. 27, 1976, Ser. No. 736,019
Int. Cl.² G05B 79/40
U.S. Cl. 318—696 **22 Claims**

1. A motion control system for producing digital motion in accordance with input commands of stepping rates for consecutive time intervals comprising means for accepting the input commands including a command for a different stepping rate for a present time interval as compared to the command for the stepping rate of a prior time interval, means for providing a train of pulses corresponding to the present commanded stepping rate including means for linearly changing the rate of the pulses in the train from initially the rate of the prior commanded stepping rate to finally the rate of the present commanded stepping rate and pulse to step means for receiving the



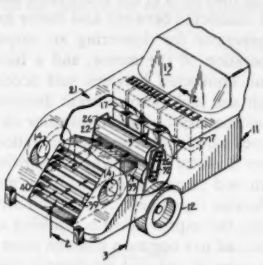
pulses and producing movement essentially in accordance with the rate of the pulses in the train.

4,075,545

CHARGING SYSTEM FOR AUTOMOBILE BATTERIES

Merle D. Haberer, Bowdle, S. Dak. 57428

Filed Dec. 6, 1976, Ser. No. 747,512
Int. Cl.² B60L 11/18; F03D 9/02
U.S. Cl. 320—61 **6 Claims**



1. In a vehicle having a body, supporting wheels for said body, motor means for driving at least one of said wheels, an electrical storage battery, and generator means for charging said battery and including field pole pieces and an armature; generator operating means for imparting relative rotation between said armature and pole pieces and comprising:

(a) a pair of impeller rotors each including a cylindrical drum and circumferentially spaced vanes projecting generally radially outwardly from said drum and extending generally longitudinally of said drum;

(b) means journaling said impeller rotors in said body on parallel axes and in closely spaced apart relationship to define an air passageway between said impellers rotors;

(c) one of said impeller rotors being operatively connected to said field pole pieces for rotation therewith;

(d) armature driving means operatively connecting the other of said impeller rotors to said armature for rotation therewith;

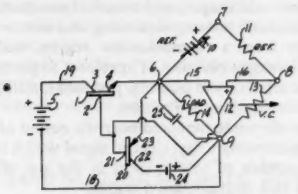
(e) conduit means defining an air inlet for movement of air from the exterior of said body to said air passageway for impartng rotation to each of said impeller rotors in a direction opposite that of the other of said impeller rotors responsive to forward movement of the vehicle, whereby to rotate said field pole pieces and armature in opposite directions relative to each other.

(f) and guide means in said body cooperating with said impeller rotors to provide discharge passageways leading from said air passageway generally circumferentially of said impeller rotors.

4,075,546
REGULATED POWER SUPPLY WITH COMBINED SERIES AND SHUNT REGULATING TRANSISTORS

Alfred William Barber, 50-16 232nd St., Bayside, N.Y. 11364

Filed Aug. 18, 1976, Ser. No. 715,397
Int. Cl.[2] G05F 1/56, 1/60
U.S. Cl. 323—22 T 3 Claims



1. In a regulated power supply including a reference voltage source, a pair of load terminals, a capacitative load connected across said load terminals, means for controlling the voltage across said load terminals in accordance with said reference voltage consisting of; an error amplifier having input and output terminals connected with its input coupled to said source of reference voltage and said load terminals in order to provide an error voltage to said amplifier, a source of unregulated voltage and a series pass transistor of a given polarity connected between said source of unregulated voltage and one of said load terminals and coupled to the output of said error amplifier for controlling the current to said load terminals and the voltage thereacross; the improvement which includes;

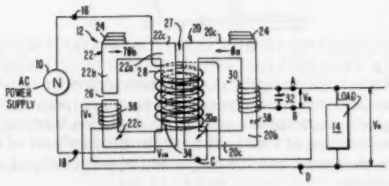
a second transistor of opposite polarity to said pass transistor connected in shunt with said load terminals and with its base coupled to the output of said error amplifier;

whereby said pass transistor solely controls current passing from said unregulated supply to said load and said second transistor solely absorbs current from said load providing two way flow of current to and from said load capacitance.

4,075,547
VOLTAGE REGULATING TRANSFORMER

Theodore Wroblewski, Danvers, Mass., assignor to Frequency Technology, Inc., Littleton, Mass.

Filed July 23, 1975, Ser. No. 598,270
Int. Cl.[2] G05F 3/06
U.S. Cl. 323—60 2 Claims



1. A ferro-resonant voltage regulating transformer, comprising:

A. first and second permeable magnetic cores, said cores spaced by an air gap and said first core comprising a closed magnetic circuit, said second core having an air gap,

B. a primary winding for connection to a source of alternating current of fluctuating voltage, said primary winding arranged around a portion of both said cores for inducing a magnetic flux therein,

C. a resonant secondary winding having first and second terminals, said resonant secondary winding being arranged around a portion of said first core, so that a voltage is induced in said resonant winding in response to the magnetic flux in said first core,

D. a capacitor in parallel with said resonant winding, said resonant winding and said capacitor forming a resonant circuit which resists voltage increases across said resonant winding beyond a preselected level and thereby substantially limits the maximum instantaneous magnetic flux in said first core over a range of primary voltage variations to regulate the voltage across the resonant circuit, whereby a substantial flux flows in said second core when the flux in said first core increases beyond the preselected level.

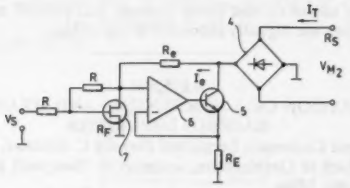
E. a direct transfer winding arranged around said primary winding, said primary winding inducing a voltage in said direct transfer winding proportional to the primary voltage,

F. a secondary correction winding around a portion of said second core, said correction winding being connected in series with said resonant winding and said direct transfer secondary winding so that the regulated output voltage is the sum of the voltages across said resonant winding, said direct transfer secondary winding and the correction winding, and whereby the flux in said second core induces a voltage in said correction winding to compensate for fluctuations in the voltage across said direct transfer winding.

4,075,548
STABILIZED VOLTAGE SOURCE HAVING A SERIES REGULATOR ON THE ALTERNATING-VOLTAGE SIDE

Erkki Ilmari Leinonen, Vantaa, Finland, assignor to Outokumpu Oy, Outokumpu, Finland

Filed Oct. 27, 1976, Ser. No. 736,084
Claims priority, application Finland, Oct. 27, 1975, 752994
Int. Cl.[2] G05F 1/48
U.S. Cl. 323—86 1 Claim



1. A series regulated stabilized alternating voltage source, which comprises:

a transformer having a primary coil and a secondary coil, said primary coil being connected between an alternating voltage power input and a load terminal;

a feedback circuit connected between a load output and, said transformer for providing a resistance in the secondary coil of the transformer which is linearly dependent upon a control voltage,

said feedback circuit including means for rectification and smoothing of load output voltage to provide an actual-value DC voltage proportional to said load output voltage, means for providing an adjustable reference DC voltage, a differential amplifier having inputs receiving said actual-value and reference voltages for amplifying the difference between said voltages to produce a control voltage, an FET transistor connected to an output of said differential amplifier, further amplifier means connected to said FET transistor and a rectifier bridge connected between said further amplifier means and the secondary coil of said transformer for transferring to said secondary coil a drain-source resistance of said FET transistor, which resistance is essentially linearly dependent upon the

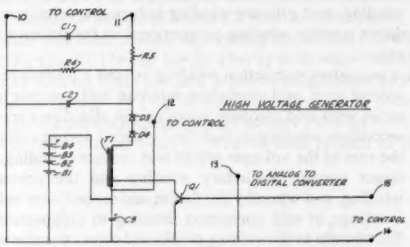
control voltage applied thereto by said differential amplifier.

4,075,549

APPARATUS AND METHOD FOR TESTING ELECTRICAL SURGE ARRESTERS

Roger P. Woodward, Atlanta, Ga., assignor to GW Electronics, Inc., Atlanta, Ga.

Filed June 1, 1976, Ser. No. 691,218
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—28 R 9 Claims



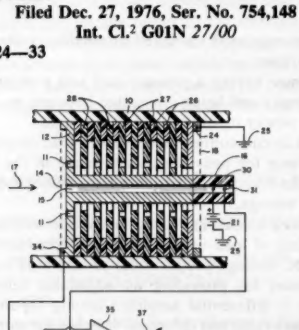
1. An electrical surge arrester tester comprising two surge arrester test leads; voltage generating means for generating and applying d.c. voltages of continuously increasing magnitudes to said surge arrester test leads; monitoring means for continuously and simultaneously monitoring the continuously increasing magnitudes of d.c. voltage being applied to and the current being conducted across said surge arrester test leads; counter means for digitally recording the firing voltage monitored by said monitoring means when the current monitored by said monitoring means exceeds a preselected magnitude; means for terminating the the application of voltage by said voltage generating means to said test leads upon recording by said counter means of said firing voltage; and display means for displaying the digitally recorded firing voltage.

4,075,550

IONIZATION CELL FOR SENSING AND MEASURING GASEOUS IMPURITIES

B. Wayne Castleman, Largo, and Bernard C. Schluter, Clearwater, both of Liechtenstein, assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 27, 1976, Ser. No. 754,148
Int. Cl.[2] G01N *27/00*
U.S. Cl. 324—33 4 Claims



1. An ionization detector with compensation means for variations in the flow rate of gas sample through the detector and for variations in the ionizing radiation source intensity, comprising:

a housing having an input and an output for flow of gas therethrough;

a source of ionizing radiation positioned in said housing in the proximity of said input;

an electrically conductive manifold mounted within said housing adjacent said source of ionizing radiation on the side nearer said output, said manifold constituting a partition within said housing separating said source of ionizing radiation from a recombination region, said manifold further having a plurality of apertures to permit gas flow from the input of said housing, past said ionizing radiation, into said recombination region;

a collector electrode mounted near the output of said housing for generating a first electric signal which is a function of the number of ions present in the gas after passing through said recombination region;

a conduit connected to said manifold, said conduit providing a passage by-passing said recombination region for a portion of said gas ionized by said radiation source;

first and second electric probes mounted in the passage of said conduit for generating a second electric signal which is a function of the number of ions present in the portion of said gas not passing through the recombination region; and

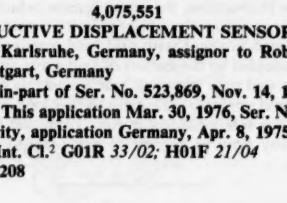
means for utilizing said second signal to compensate for variations in said first signal caused by variations in the rate of gas flow and/or variations in intensity of said source of ionizing radiation.

4,075,551

INDUCTIVE DISPLACEMENT SENSOR

Erich Zabler, Karlsruhe, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Continuation-in-part of Ser. No. 523,869, Nov. 14, 1974, Pat. No. 3,973,191. This application Mar. 30, 1976, Ser. No. 671,984
Claims priority, application Germany, Apr. 8, 1975, 2515256
Int. Cl.[2] G01R *33/02;* H01F *21/04*
U.S. Cl. 324—208 9 Claims



1. An inductive angular displacement sensor for converting mechanical movement in angular displacement into an electrical signal in accordance with a desired relation between angular displacement of a body, the angular displacement of which is to be measured, and the magnitude of said electrical signal, comprising:

a ferromagnetic core having at least two circularly elongated legs (7,8) connected by a yoke portion (2) of said core at one end of said legs, said legs having an elongated gap between them of a width that varies along the circularly bent length of said legs,

a magnet winding (1) in the neighborhood of the yoke portion (2) of said core (3) wound so as to produce magnetic flux in said elongated gap(s) between the legs (7,8) of said core (3),

a short-circuiting ring member (4) pivoted on an axis perpendicular to the plane of curvature of said legs and passing through their centers of curvature, said short-circuiting ring member providing a short-circuiting path around and substantially adjacent to each leg of the core at substan-

tially the same angular position with respect to said axis and being angularly displaceable about said axis and along the bent length of said core legs in response to angular displacement of the body the displacement of which is to be measured, and

an oscillator circuit (**30, 32, 34**) in which said magnet winding is connected for varying the frequency of oscillation in accordance with the angular displacement of said short-circuiting ring member, said oscillator comprising the series combination of a comparator (**30**) having a hysteresis characteristic, an inductance circuit which includes said magnet winding (**1**) and an integrator (**34**), and in which the output of said integrator (**34**) is connected with the variable voltage input of said comparator (**30**).

4,075,552

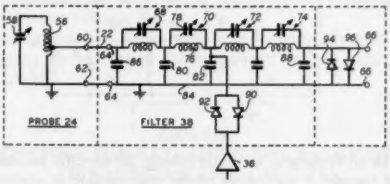
WIDE-BAND NUCLEAR MAGNETIC RESONANCE SPECTROMETER

Daniel D. Traficante, 16 Fairbanks Road, and Michael Mulcay, 21 Grant Place, both of Lexington, Mass. 02173

Filed Apr. 24, 1975, Ser. No. 571,433

Int. Cl.[2] G01N *27/00*

U.S. Cl. 324—0.5 AH **16 Claims**



1. In a wide-band nuclear magnetic resonance spectrometer for determining the NMR frequency of a sample in an external magnetic field, a system comprising transmitting means for generating a signal having a frequency equal to the NMR frequency of the sample, receiving means for receiving the signal from the sample, and probe means for applying said signal from said transmitting means to the sample and for applying the signal from said sample to said receiving means, said probe means comprising a first coil adapted to be inductively coupled to the sample and connected across a capacitor to form a tank circuit resonant at the NMR frequency of the sample for detecting the signal of NMR frequency from the sample, and a second coil coupled by mutual inductance to said first coil for applying said sample signal to said receiving means.

4,075,553

ELECTROMAGNETIC DETECTOR RESPONSIVE TO A MODIFICATION OF RADIATED FIELD BY AN INTRUDING METALLIC OBJECT

René Bouverot, and Jean-Raymond Narbaits-Jaureguy, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 5, 1976, Ser. No. 729,802

Claims priority, application France, Oct. 7, 1975, 75 30695

Int. Cl.[2] G01R *33/12*

U.S. Cl. 324—233 **13 Claims**

1. An electromagnetic detector responsive to the intrusion of a metallic object into a radiated energy field, comprising:

field-generating means including a transmitter coil centered on a first axis and a source of alternating current connected to said transmitter coil;

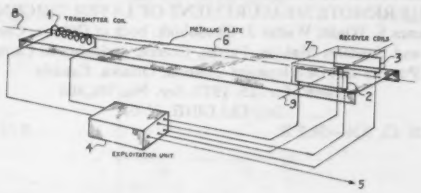
pick-up means including a pair of closely juxtaposed receiver coils disposed on opposite sides of said first axis, said receiver coils being substantially centered on a second axis spaced from said transmitter coil and generally transverse to said first axis;

circuit means for deriving a reference oscillation from said source;

a pair of amplifiers respectively connected to said receiver coils, said amplifiers being provided with individual gain-control inputs for varying the amplitudes of currents induced in the associated receiver coils;

summing means connected to said amplifiers for combining the amplified currents thereof into a resultant oscillation varying in phase, with respect to said reference oscillation, with the relative amplitudes of said amplfied currents;

phase-comparison means connected to said circuit means and to said summing means for receiving said reference



oscillation and said resultant oscillation therefrom, said phase-comparison means having a pair of output terminals respectively energizable in response to phase differences of different sign;

slow-acting feedback means connecting each of said output terminals to a respective one of said gain-control inputs for maintaining a cophasal relationship between said reference oscillation and said resultant oscillation in the absence of an intruding metallic object; and

utilization means connected to said output terminals.

4,075,554

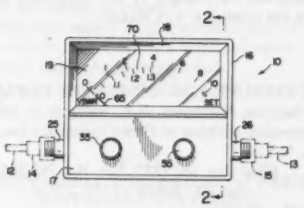
VSWR METER CIRCUIT USING VARIABLE RF ATTENUATOR

Frank Howard Mecklenburg, Shaker Heights, Ohio, assignor to Bird Electronic Corporation, Solon, Ohio

Continuation-in-part of Ser. No. 719,565, Sept. 1, 1976. This application Nov. 3, 1976, Ser. No. 738,474

Int. Cl.[2] G01R *27/02, 21/04*

U.S. Cl. 324—58 B **1 Claim**



1. In an instrument for detecting and measuring directional RF voltage wave signals on a coaxial transmission line and including a coaxial line section adapted to be inserted in said transmission line, an inductive pick-up coil mounted for rotation about an axis normal to the axis of said line section for selectively sensing and measuring the magnitude of both the forward and reflected RF voltage standing waves on said transmission line, D'Arsonval meter movement means, and circuit means operatively connected between said meter movement means and said inductive pick-up coil, said circuit means including a rectifier diode and a scale expanding potentiometer for setting the meter pointer to a fixed index point on the meter scale when said inductive pick-up coil is rotated to a position to sense the forward RF voltage wave on said transmission line whereby when said inductive pick-up coil is thereafter rotated approximately 180° to a position to sense the reflected RF voltage wave on said transmission line, said pointer may indicate the voltage standing wave ratio on a respective meter scale, the improvement wherein said circuit means comprises:

a variable RF attenuator electrically connected between said

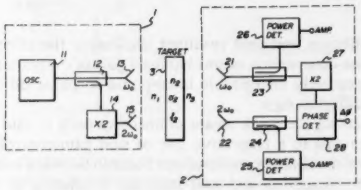
diode and said inductive pick-up coil, said attenuator including a series resistor, a shunt resistor and said scale expanding potentiometer connected in series with said shunt resistor, whereby the deflection of said D'Arsonval meter movement means is relatively undistorted throughout the range of induced RF voltage levels sensed by said pick-up coil.

4,075,555

ELECTRONIC PHASE COMPARISON APPARATUS FOR THE REMOTE MEASUREMENT OF LAYER THICKNESS

James S. Wight; Walter J. Chudobiak, both of Ottawa, Canada, and Vassilios Makios, Patras, Greece, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Mar. 25, 1977, Ser. No. 781,506
Int. Cl.[2] G01R *27/04*
U.S. Cl. 324—58.5 R **8 Claims**



1. Apparatus for the remote measurement of the thickness of n layers in a dielectric target where $n \geqq 1$. comprising:

transmitter means having $n + 1$ single frequency channels for directing $n + 1$ related frequency signals to the target; and

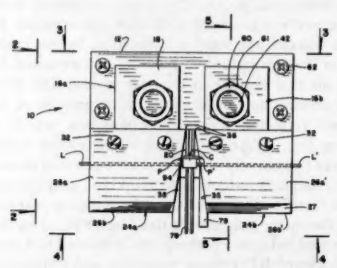
receiver means for receiving the $n + 1$ signals from the target, said receiver means including first means for converting the signals to a common frequency and second means for comparing the phase of pairs of the converted signals for determining the thicknesses l of the n layers as a function of the phase differences where $l < \lambda/4$, λ being the shortest wavelength of the difference frequency between the related $n + 1$ signals.

4,075,556

TEST FIXTURE FOR MINIATURE CAPACITORS

Harry V. Seaman, Northport, N.Y., assignor to American Technical Ceramics, division of Phase Industries Inc., Huntington Station, N.Y.

Filed Jan. 28, 1977, Ser. No. 763,346
Int. Cl.[2] G01R *11/52, 27/26*
U.S. Cl. 324—60 C **10 Claims**



1. A test fixture for a miniature capacitor having terminal leads and conductive ends, comprising an insulative support;

two shield plate assemblies mounted on said support in coplanar spaced disposition, each shield plate assembly comprising:

a pair of flat conductive shield plates disposed parallel to each other with edges in registration; and

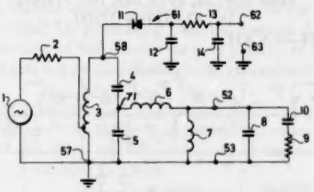
a spacer plate disposed between said shield plates, for receiving an axial one of said terminal leads between said shield plates and opposing inner edges of said spaced shield plate assemblies being disposed angularly to each other for engaging opposite conductive ends of said capacitor therebetween.

4,075,557

CONTACTLESS FACILITIES FOR DETERMINING THE SPECIFIC RESISTANCE OF A TEST SAMPLE

Milos Jurca, Prague, Czechoslovakia, assignor to CKD Praha, oborovy podnik, Prague, Czechoslovakia

Filed Oct. 1, 1976, Ser. No. 728,839
Claims priority, application Czechoslovakia, Oct. 1, 1975, 6635/75
Int. Cl.[2] G01R *27/02*
U.S. Cl. 324—62 **9 Claims**



1. In an apparatus for determining the specific resistance of a test sample, a capacitive probe positionable in electrostatic coupling relation to the surface of the sample, a first coil having a reference terminal, a first path connected across the first coil and including first and second serially connected capacitors, a second path including first and second serially connected reactors for compensating the coupling capacitance between the probe and the substrate and the capacitance of the probe, respectively, means for connecting the second path between the junction of the first and second capacitors and the reference terminal, means for connecting the probe between the junction of the first and second reactors and the reference terminal, voltage detecting means connected across the first path, and means for supplying a high-frequency exciting current to the first coil, thereby to vary the voltage across the voltage detecting means as a prescribed function of variations in the specific resistance of the sample.

4,075,558

METHOD OF AND SYSTEM FOR METERING A PERIODICALLY VARYING VOLTAGE

Peter Harzer, Eningen, Germany, assignor to Wandel U. Goltermann, Reutlingen, Germany

Filed Sept. 7, 1976, Ser. No. 720,785
Claims priority, application Germany, Sept. 6, 1975, 2539694
Int. Cl.[2] G01R *17/06, 19/22*
U.S. Cl. 324—99 R **10 Claims**

3. A system for determining the average amplitude of a pulsating input voltage, comprising:

a supply of continuous direct current;

a capacitor connected to said supply for charging by said continuous current;

subtractive circuitry including first current-control means pulsed by said input voltage connected to said capacitor for reverse-charging same during pulsations of said input voltage at a rate depending upon the magnitude of said pulsations;

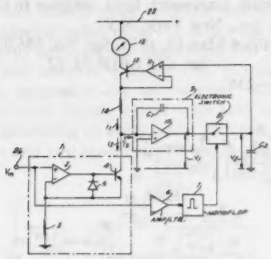
switch means controlled by said input voltage and connected to said capacitor for sampling the charge thereof at a point in each cycle of said input voltage, substantially coinciding with the beginning of each pulsation, at which

said charge is at a substantially constant level during steady-state operation;

storage means connected to said switch means for deriving a reference voltage from successive charge samples;

second current-control means in series with said supply;

circuit means connecting said storage means to said second



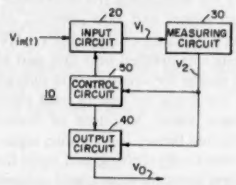
current-control means for varying the magnitude of said continuous current in response to said reference voltage to compensate for variations of said level due to changes in said input voltage; and

metering means in series with said second current-control means for measuring the magnitude of said continuous current.

4,075,559
TECHNIQUE FOR EXTENDING THE RANGE OF A SIGNAL MEASURING CIRCUIT

Anthony G. Chaprnka, Cockeysville, Md.; Shan C. Sun, Pittsburgh, and Leonard C. Vercellotti, Verona, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 24, 1975, Ser. No. 598,611
Int. Cl.[2] G01R *15/08, 17/06;* **H04B** *1/64*
U.S. Cl. 324—115 **6 Claims**



1. The combination of:

a signal measuring circuit means having an input and an output, and a defined dynamic range;

an input circuit means connected to said input of said signal measuring circuit means, said input circuit means adjusting the magnitude of an input signal to a level within said defined dynamic range, the resulting adjusted signal being supplied to said signal measuring circuit means, said signal measuring circuit means producing a first output signal corresponding to a measured characteristic of the adjusted signal;

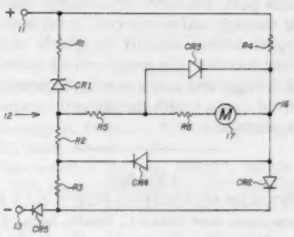
an output circuit means connected to the output of said signal measuring circuit means to adjust the magnitude of said first output signal to a level corresponding to said input signal to produce a second output signal indicative of the measured characteristic of said input signal; and

a control circuit means connected for producing first and second control signals, said input circuit means responding to said first control signal by adjusting the magnitude of said input signal a predetermined amount in a first direction and said output circuit means responding to said second control signal by adjusting the magnitude of said first output signal said predetermined amount in the opposite direction to produce said second output signal.

4,075,560
EXPANDED SCALE ELECTRICAL MEASURING CIRCUIT

Francis J. Stifter, 171 South Main St., Natick, Mass. 01760

Continuation of Ser. No. 555,065, March 3, 1975, abandoned. This application Dec. 10, 1976, Ser. No. 749,286
Int. Cl.[2] G01R *15/08*
U.S. Cl. 324—131 **9 Claims**



1. A measuring circuit comprising:

a four-arm bridge having a pair of input terminals for connection to a source of input voltage to be measured, each of said input terminals connecting ends of a different pair of the arms of said bridge;

a first measuring terminal connecting opposite ends of one pair of arms comprising one arm in each of said different pairs of arms;

a second measuring terminal connecting opposite ends of another pair of arms comprising the other arms in each of said different pairs of arms;

voltage divider means in said one pair of arms, said voltage divider means comprising in a first arm of said one pair of arms a series combination of a linear resistor and a voltage regulator semiconductor means for producing a fixed reduction in the portion of said input voltage applied to said first measuring terminal;

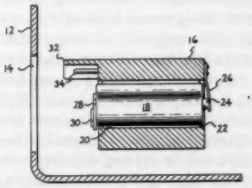
voltage reference means in said another pair of arms, said voltage reference providing a fixed reference voltage at said second measuring terminal; and

measuring means connecting said first and second measuring terminals.

4,075,561
PROGRAMMABLE ELECTRICAL APPARATUS CONTAINING A BATTERY

Francis Joseph Stevens, North Berwick, Maine, assignor to General Electric Company, New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,675
Int. Cl.[2] G01R *1/04, 35/04, 1/20*
U.S. Cl. 324—149 **6 Claims**



1. A programmable electrical apparatus containing a replaceable battery, comprising:

a. an electrical apparatus containing a replaceable battery and having an electrically programmable system therein;

b. a housing for enclosing said apparatus having a small access port therein for the installation and removal of replacement batteries and the insertion of a terminal coupling member of a programming instrument; and

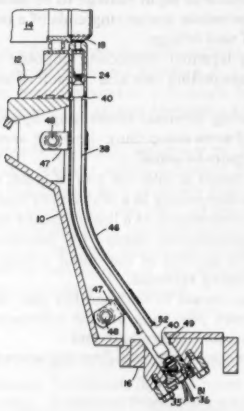
c. a composite unit including an integral battery supporting receptacle and an integral electrical terminal connector for making electrical contact with a terminal coupling member of a programmable instrument, said battery supporting receptacle and terminal connector of the unit being positioned inside the housing of the apparatus concentrically aligned with the access port of the housing and within a circumferential area smaller than the periphery of the access port, whereby replacement batteries can be installed through said access port in the housing and into the integral battery support receptacle and a terminal connecting member of a programming instrument can be inserted through said access port in the housing for mating in electrical contact with the integral terminal connector of the apparatus.

4,075,562

SPEED SENSOR MOUNTING FOR A GAS TURBINE

Karl W. Karstensen, and Brace C. Smith, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 1, 1976, Ser. No. 728,588
Int. Cl.[2] G01P *3/48*
U.S. Cl. 324—173 **9 Claims**



1. In a gas turbine engine having an output shaft mounted in a casing, the output shaft having a toothed nut mounted thereon, and a magnetic device responsive to rotation of the output shaft for generating a current fluctuating in direct proportion to the speed of rotation of the output shaft, an electromagnetic speed sensor mounting assembly for mounting said magnetic device adjacent said toothed gear comprising:

electrical conduit means interconnected with said magnetic device for conducting the fluctuating current therefrom;

threadably bored fitting means lockingly receiving the magnetic device, said magnetic device partially extending from a first end of the bored fitting means a predetermined distance so that the bored fitting means forms a stopped juncture with the magnetic device, said electrical conductor means extending from the other end thereof;

socket means rigidly associated with the turbine casing in the vicinity of the toothed nut and defining a threaded radial bore relative the shaft and a counterbore extending outwardly therefrom, said counterbore slidably receiving the fitting means allowing the magnetic device to be threadably received in the threaded radial bore;

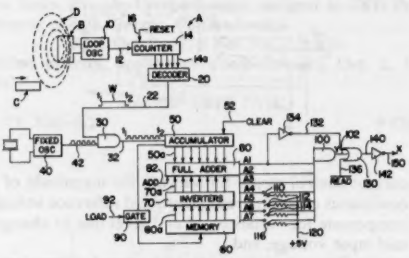
flexible conduit means removably lockably affixed to the threadably bored fitting means for protecting the electrical conductors and for rotating the fitting means in the socket means.

4,075,563

DIGITAL LOOP DETECTOR WITH IMPROVED DETECTION CONTROL

Francis L. Battle, Davenport, Iowa, assignor to Gulf & Western Industries, Inc., New York, N.Y.

Filed May 13, 1976, Ser. No. 686,026
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—236 **9 Claims**



1. In a digital detector device for detecting a metal object in the field of influence of a detector loop controlling the frequency of pulses created by an oscillator, said digital detector device including counter means for counting said pulses created by said oscillator during a counting interval having a selected duration whereby the magnitude of the pulses counted during said controlled interval is indicative of the inductance of said loop and digital means for creating an output signal when the number of pulses counted by said counter means for a given counting interval differs from a selected count by a number greater than a selected threshold number, the improvement comprising: said digital means including means for creating a binary coded signal having a series of binary bits arranged in a selected order for indicating the difference between said number of counted pulses and said selected count; a binary logic circuit having a plurality of input lines individually corresponding to said bits and divided into first and second groups, an output line and means for creating said output signal in said output line when the logic on one of said input lines is at a selected binary logic value; a source of binary logic value opposite to said selected binary logic value; separate sensitivity switch means for selectively shifting said input lines of said first group between a first position where said associated input line has a binary condition controlled by a corresponding one of said binary bits and a second position where said associated input line has a binary condition controlled by said binary logic source; means for directing bits of binary logic to corresponding input lines of said second group of input lines; and, means for inhibiting creation of said output signal when a selected one of said input lines in said second group is at said selected binary logic value.

4,075,564

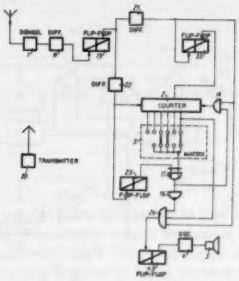
SELECTIVE CALLING ARRANGEMENT

Christian Masur, Grenchen, and Václav Štverák, Solothurn, both of Switzerland, assignors to Autophon Aktiengesellschaft, Solothurn, Switzerland

Filed Apr. 28, 1976, Ser. No. 680,916
Claims priority, application Switzerland, Apr. 28, 1975, 5435/75
Int. Cl.[2] H04B *1/00*
U.S. Cl. 325—55 **3 Claims**

1. In a selective calling system of the type wherein a fixed transmitter transmits a binary-encoded calling signal to a plurality of portable receivers, said calling signal comprising radio-frequency pulses of uniform width separated by first and

second intervals respectively representative of the two binary states in said calling signal, and wherein each said receiver comprises means for receiving the encoded pulses transmitted by said transmitter, comprising an RF demodulator for generating DC pulses corresponding to said radio-frequency pulses, a first timing circuit triggered in dependence of said DC pulses, the holding time of said first timing circuit being intermediate said first and said second pulse intervals and being restored with every triggering pulse, means to detect the binary value of each interval by detecting the state of said first timing circuit at the end of said interval, a memory for storing the binary signal uniquely assigned to call said receiver, means for comparing said detected binary signal with said stored binary signal and for generating an alarm signal if there is a correspondence between said two binary signals and means for generating a reset signal for restoring said comparing means if there is no generation of DC pulses during a certain time interval, the improved receiver which comprises:



a first differentiating circuit connected to the output of said demodulator for generating a train of short pulses corresponding to the leading edges of said DC pulses;

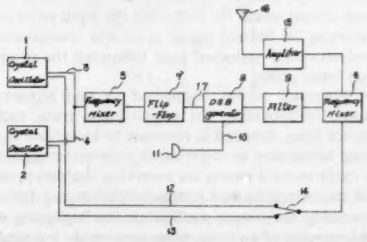
a second timing circuit having a triggering input connected to the output of said first differentiating circuit, said second timing circuit, when triggered, generating a pulse which has a duration substantially equal to the duration of each of said pulses of uniform width, said pulse duration is unaffected by repeated triggering of said second timing during the generation of said pulse, said pulse exclusively determining the triggering and the moment of detecting the state of said first timing circuit.

4,075,565

SINGLE SIDE-BAND WAVE GENERATION SYSTEM

Arai Kazuo, Kitamoto, Japan, assignor to Nissan Denshi Kabushikikaisha, Japan

Filed May 17, 1976, Ser. No. 686,681
Claims priority, application Japan, Oct. 17, 1975, 50-125493
Int. Cl.[2] H04B 1/04
U.S. Cl. 325—138 **19 Claims**



2. Single sideband wave generating apparatus comprising:

a first oscillator producing a first wave of a first frequency;

a second oscillator producing a second wave of a second and different frequency;

means for mixing said first and second waves to produce a third wave of a third frequency corresponding to the difference between said first and second frequencies;

means for dividing the frequency of said third wave to produce a carrier wave of a frequency corresponding to a predetermined portion of said third frequency;

a source of an audio frequency input signal;

means for producing a modulated wave at said carrier wave frequency modulated by said audio frequency signal; and

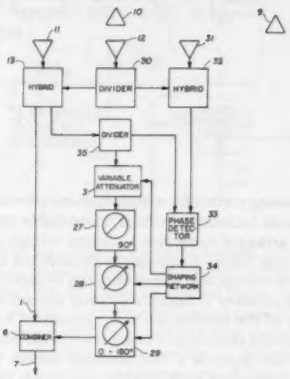
means for mixing said modulated wave with one of said first and second waves to produce a single sideband output wave.

4,075,566

CO-CHANNEL INTERFERENCE SUPPRESSION APPARATUS

Timothy D'Arcangelis, Oakdale, N.Y., assignor to CATV Components Co., Stony Brook, N.Y.

Continuation-in-part of Ser. No. 239,697, March 30, 1972, abandoned. This application Apr. 15, 1974, Ser. No. 461,155
Int. Cl.[2] H04B 1/10
U.S. Cl. 325—369 **3 Claims**



1. Apparatus to suppress an interference signal on the same frequency as a desired signal, comprising:

a) a sum and difference hybrid having a first and second input port and two output ports, one a sum port and the other a difference port, the first and second input ports receving signals from a first and second antenna respectively of a two antenna array directed at the desired signal source,

b) a combiner having a first and second input port and one output port the first input port of the combiner being connected to the hybrid sum port and the second input port of the combiner being connected to the hybrid difference port,

c) means for introducing a change in amplitude in the signal from one of the output ports of the hybrid to permit the interference signal component of said signal from the hybrid to be made equal in magnitude to the interference signal component of the signal from the other output port of the hybrid, and

d) means for introducing a change in phase of substantially 90° in one of the output signals from the hybrid to permit the interference component of that signal to be placed in phase opposition with the interference component of the other output signal from the hybrid to produce cancellation of the interference signal components when the hybrid output signals are added in the combiner, said means for introducing a change in phase includes a variable phase shifter, a fixed 90° phase shifter, a switchable 180°

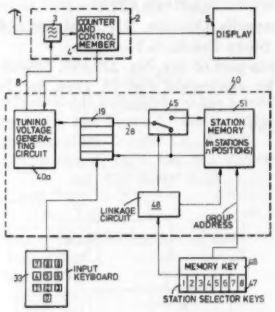
phase shifter in series with the 90° phase shifter to produce in combination a plus 90° total phase shift when the 180° phase shifter is switched out of the circuit and a −90° phase shift when the 180° phase shifter is switched into the circuit.

4,075,567

BROADCAST RECEIVER TUNING CIRCUIT WITH STATION MEMORY

Otto Klank, Arpke, and Dieter Rottmann, Misburg, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Dec. 21, 1976, Ser. No. 753,082
Claims priority, application Germany, Dec. 22, 1975, 2557856
Int. Cl.[2] H04B *1/16*
U.S. Cl. 325—453 **17 Claims**



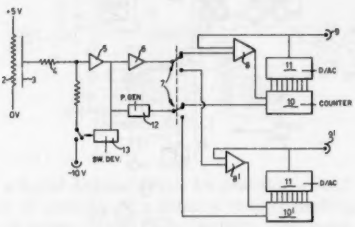
1. In a tuning circuit for a high frequency broadcast receiver, which circuit includes a voltage controllable superheterodyne oscillator arranged to receive a control voltage and to produce an oscillation whose frequency is determined by the value of the control voltage and determines the broadcast frequency to which the receiver is tuned, a counter connected to sense the frequency of the oscillations being generated by the oscillator and to produce therefrom a count state in the form of representations of the digits of a first decimal number identifying the broadcast frequency to which the receiver is currently tuned, input means for generating representations of the digits of a second decimal number identifying the broadcast frequency to which it is desired to tune the receiver, a circulating memory having a plurality of memory cells, including a memory input cell and a memory output cell, for storing a succession of digit representations and having an input connected to the input means for receiving the representations of successive digits of the second number and a feedback path connected for causing the representations in the memory output cell to be conducted back to the memory input cell and a comparison circuit for comparing the decimal number representations being produced by the counter and contained in the memory to vary the control voltage in a direction to cause the number representation produced by the counter to coincide with the number representation generated by the input means, the comparison circuit including a single comparator capable of comparing, at one time, only the representations of one digit of each of two numbers, and time multiplex means connected for delivering to the comparator, in succession, each digit representation produced by the counter, starting with the most significant digit, and, simultaneously therewith, each digit representation of corresponding significance generated by the input means, the improvement comprising: a station memory for storing the digit representations completely identifying at least one broadcast frequency, means for selectively connecting said station memory into the feedback path of said circulating memory in a manner to permit transfer of data between said memories; an input unit actuable for providing signals identifying particular station memory locations and initiating a station memory write-in operation; and a logic linkage circuit connected between said input unit and said station memory for selectively writing digit representations currently in said circulating memory into particular station memory locations or reading into said circulating memory digit representations previously stored in particular station memory locations.

4,075,568

ELECTRICAL CONTROL DEVICE

David Vaughan Watkins, London, England, assignor to Fidelity Radio Limited, London, England

Filed Feb. 18, 1976, Ser. No. 659,048
Claims priority, application United Kingdom, Feb. 19, 1975, 7094/75
Int. Cl.[2] H03K *3/26;* H04B *1/06;* G01N *27/00*
U.S. Cl. 328—1 **14 Claims**



1. Electrical apparatus comprising:
a control device defining a continuously variable quantity which can be set to a selected value by application of the operator's finger;
sensing means connected to said control device and having a first output signal variable over a range of values when the finger is present at said control device thereby placing said control device in a chosen condition, and having a second output signal when in the normal condition with the finger absent from said control device; and
digital storage means coupled to said control device and said sensing means, said storage means being adapted to positively store information representative of said selected value upon removal of the finger from said control device.

4,075,569

DIGITAL METHOD AND APPARATUS FOR DYNAMICALLY GENERATING AN OUTPUT PULSE TRAIN HAVING A DESIRED DUTY CYCLE FROM AN INPUT PULSE TRAIN

Howard O. Wright, Irvine, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 27, 1976, Ser. No. 727,071
Int. Cl.[2] H03K *5/04*
U.S. Cl. 328—58 **10 Claims**

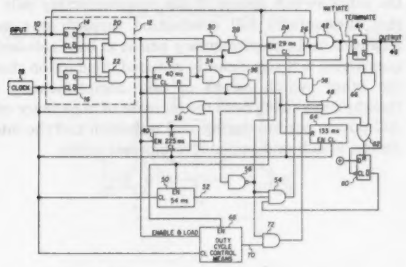
1. Digital apparatus for dynamically generating an output pulse train in response to an input pulse train, comprising:
inititate circuit means for receiving the input pulse train and providing an initiate signal upon the transpiration of a predetermined period of time following the inception of each input pulse;
pulse generator means connected to said initiate circuit means for providing the output pulse train, each pulse thereof being initiated in response to an initiate signal and being terminated in response to a terminate signal;
duty cycle control means for receiving the input pulse train and connected to said initiate circuit means for digitally measuring each input cyclical period beginning with the leading edge of an input pulse to provide a digital counting interval indicative thereof and during the next successive input cyclical period traversing said digital counting interval in a time corresponding to a predetermined per-

centage of the measured cyclical period in response to said initiate signal, and

terminate circuit means for receiving the input pulse train and connected to said duty cycle control means for generating said terminate signal upon the earlier completion of said digital counting interval traversal or the input cyclical period during which it begins.

9. A digital method for dynamically generating an output pulse train in response to an input pulse train, comprising:

generating an initiate signal upon the transpiration of a predetermined period of time following the inception of each input pulse;



initiating an output pulse in resonse to said initiate signal and terminating it in response to a terminate signal;

digitally measuring each input cyclical period beginning with the leading edge of an input pulse to provide a digital counting interval indicative thereof and during the next successive input cyclical period traversing said digital counting interval in a time corresponding to a predetermined percentage of the measured, cyclical period in response to said inititate signal, and

generating said terminate signal upon the earlier completion of said digital counting interval or the input cyclical period during which it begins.

4,075,570

CIRCUIT ARRANGEMENT FOR TRANSMITTING AN ALTERNATING CURRENT OSCILLATION HAVING DIRECT CURRENT COMPONENTS WHICH CAN BE CHANGED ABRUPTLY

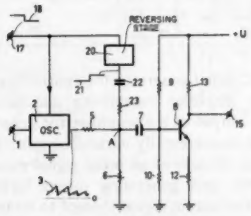
Jörg Wölber, Pinneberg-Thesdorf, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 13, 1976, Ser. No. 714,256

Claims priority, application Germany, Aug. 16, 1975, 2536495

Int. Cl.[2] H03K *1/14*

U.S. Cl. 328—262 **8 Claims**



1. A circuit comprising:

an output stage;

a first high pass filter having an input means for receiving an alternating current oscillation having a direct current component with an amplitude in accordance with the amplitude of said oscillation, said direct current component being subject to undesired rapid changes and an output means coupled to said stage for applying said high pass filtered alternating current oscillation together with said undesired direct current component rapid changes to said output stage; and

a second high pass filter having an input means for receiving a control signal having rapid changes coinciding with said undesired rapid changes for effecting rapid changes in the amplitude of said alternating current oscillation, whereby the amplitude of said direct current component has rapid changes in accordance with said control signal, and an output means coupled to said stage for applying to said output stage a high pass filtered control signal with a variation for compensating only for said undesired rapid changes of said direct current component of said alternating current oscillations, said first and second filters having a cutoff frequency component of said oscillation and said control signal respectively.

4,075,571

EXTERNALLY BIASED VIDEO DETECTOR CIRCUIT FOR LIMITING CLUTTER AND NOISE IN A DETECTED RADAR SIGNAL

Garry N. Hulderman, Riverside, and Jay B. Winderman, Claremont, both of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Filed June 8, 1977, Ser. No. 804,671

Int. Cl.[2] H03K *9/00, 19/12*

U.S. Cl. 329—104 **4 Claims**

1. A video detector circuit for a radar system, comprising,

a detector diode having one of its electrodes connected to an input terminal for detecting an applied signal containing target information, rms noise voltage and components that are representative of clutter, and its other electrode connected to a load terminal for providing a detected signal, wherein the operating characteristics of the diode are defined by a curve having a gradual portion in which the diode forward current increases slightly as the diode forward voltage is increased from zero volts, a steep portion in which the diode forward current increases sharply as the diode forward voltage is further increased, and a knee portion defining a transition between the gradual and steep portions; and

a load resistance connected between the load terminal and a bias terminal;

wherein the improvement comprises,

means for providing a dc potential at the bias terminal to forward bias the detector diode to have a quiescent operating point below the midpoint of the knee portion of its said characteristic curve, thereby limiting diode rms noise current and components in said detected signal that are representative of clutter.

4,075,572

ISOLATION AMPLIFIER HAVING IMPROVED FIDELITY

George A. Cavigelli, Lexington, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Jan. 6, 1977, Ser. No. 757,166

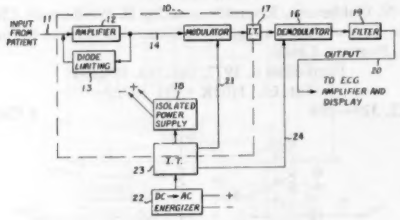
Int. Cl.[2] H03F *3/38*

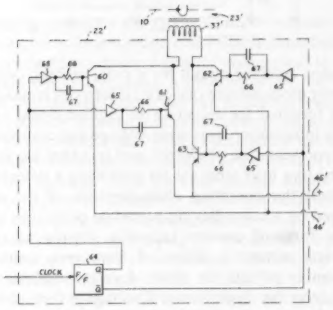
U.S. Cl. 330—10 **3 Claims**

1. In an isolation amplifier for providing a high degree of conductive isolation between its input and output and for amplifying low level DC input signals, the amplifier compris-

ing: an input portion for receiving the DC input signal and including an AC energized modulator to produce an AC signal substantially corresponding to the DC input signal, an output portion for receiving the AC signal from the input portion and including a phase sensitive demodulator to produce a corresponding, relatively amplified DC output signal, first circuit means for inductively non-conductively coupling said AC signal from said input portion to said output portion, an AC power portion for producing an AC energizing signal for said modulator and said demodulator, said power portion including means having a pair of terminals for connection across a source of DC power for generating said AC energizing signal and second circuit means comprising a transformer having a secondary winding in said input portion and having its primary winding operatively connected in said power portion for non-conductively coupling the AC energizing signal from said AC energizing signal generating means to said input portion to activate said modulator, third circuit means for coupling the AC energizing signal from said power portion AC signal generating means to said output portion to activate said demodulator, said AC power portion exhibiting relatively low impedance during the opposite amplitude extremes of the AC cycle and normally a relatively higher impedance during the transition between the opposite amplitude extremes, the coupling of common mode interference signal sources through stray capacitance to said AC power portion being operative during said normally higher impedance thereof to modify the output voltage therefrom sufficiently to possibly interfere with the accurate reproduction of the input signal as the DC output signal;

the improvement wherein said AC energizing signal generating means of said AC power portion comprises a pair of complementary switch means actuable for alternately and oppositely connecting a source of DC power to said transformer primary to provide said AC energizing signal, each switch means of said complementary pair comprising a separate pair of semi-conductor switches having at least three electrodes including a control electrode, one switch of each said separate pair being connected intermediate one end of said transformer primary and one DC power source terminal and the other switch of said separate pair being connected intermediate the other end of said transformer primary and the other DC power source terminal, and means for controlling the conduction and non-conduction of said complementary pair of switch means, said switch conduction controlling means including means for generating a pair of square wave control signals of opposite polarity having relatively fast rise and fall times and means for connecting said square wave control signals of one polarity to the control electrodes of the switches comprising one switch means of the complementary pair and said square wave control signals of the opposite polarity to the control electrodes of the switches comprising the other switch means of the complementary pair such that substantially full conduction through one switch means of said complementary pair is at least substantially concurrent wit significantly reduced conduction through the other switch means of said complementary pair, thereby minimizing both the increase of impedance of said AC power portion during said transition and the interval during which said impedance increase exists.



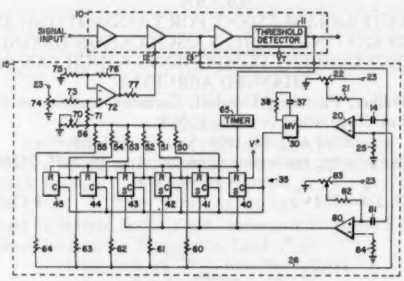


4,075,573

INCREMENTAL AGC SIGNAL GENERATOR WITH CONTROLLABLE INCREMENTS

Howard L. Kennedy, Phoenix, and John Ooms, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 5, 1977, Ser. No. 757,116
Int. Cl.[2] H03G *3/20*
U.S. Cl. 330—129 **9 Claims**



1. An AGC signal generator for controlling the output of a variable gain amplifier comprising generating means connected to the output of the amplifier for generating an output signal with an incrementally variable amplitude in response to the application thereto of an input signal exceeding an AGC threshold level, said generating means further causing the amplitude of the output signal thereof to increase in predetermined increments from a reference level in response to the application of the input signal in excess of the AGC threshold level for a period greater than a predetermined interval, the output signal from said generating means being coupled to control the output of the variable amplifier, and timing means responsive to signals at the output of the amplifier and connected to said generating means for returning the output signal thereof to the reference level when the signal at the output of the amplifier is below a threshold value for a predetermined length of time.

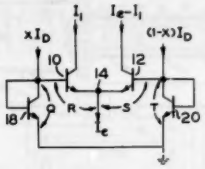
4,075,574
WIDEBAND DIFFERENTIAL AMPLIFIER

Barrie Gilbert, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 623,214, Oct. 16, 1975, abandoned, which is a division of Ser. No. 540,499, Jan. 13, 1975, Pat. No. 3,931,583, which is a continuation of Ser. No. 258,111, May 30, 1972, abandoned, which is a division of Ser. No. 27,765, April 13, 1970, Pat. No. 3,689,752, which is a continuation-in-part of Ser. No. 701,257, Jan. 29, 1968, abandoned, and Ser. No. 835,558, June 23, 1969, abandoned. This application July 15, 1976, Ser. No. 705,634

Int. Cl.² H03F *3/45*

U.S. Cl. 330—257 **19 Claims**



6. A wide band differential amplifier, comprising:

a pair of differentially coupled transistors the emitters of which are coupled together to a suitable source of current, and each having a base terminal and a collector output terminal; and

a pair of input devices receiving differential input signal currents and respectively connected to the differentially coupled transistors, said input devices comprising a pair of semiconductor junction devices having junctions similar to those of said differentially coupled transistors,

said input devices having logarithmic characteristics substantially matching that of said differentially coupled transistors for producing a linear output at said output terminals.

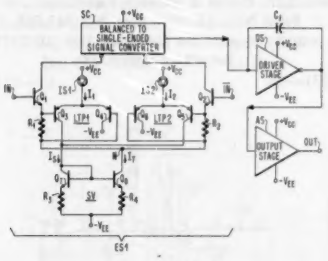
4,075,575
INPUT STAGE FOR FAST-SLEWING AMPLIFIER

Thomas Joseph Robe, Union, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,867

Int. Cl.² H03F *3/45*

U.S. Cl. 330—259 **14 Claims**



1. A fast-slewing multi-stage amplifier having, in cascade connection, an input stage and stageand at least one succeeding amplifier stage with associated capacitance, the charge on which capacitance must be changed during slewing, wherein said input stage comprises:

first and second transistors of a first conductivity type, each having emitter and collector electrodes and a principal conduction path therebetween and having a base electrode;

means connecting said first and second transistors in long-tailed pair configuration including:

means for applying a first input potential to the base electrode of said first transistor;

means for applying a second input potential to the base electrode of said second transistor; and

a controlled source of tail current connected to an interconnection between the emitter electrodes of said first and said second transistors;

and means responsive to decreased current flowing in the principal conduction path of said first transistor to apply a control signal to said controlled source of tail current to increase said tail current.

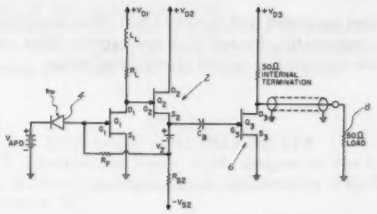
4,075,576
SENSITIVE HIGH SPEED SOLID STATE PREAMP

Richard C. Eden, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 25, 1977, Ser. No. 772,173

Int. Cl.² H03F *3/16*

U.S. Cl. 330—277 **13 Claims**



1. A preamp comprising:

an input stage including

a first FET having a drain coupled to a positive voltage, a gate for coupling to the input of the preamp, and a grounded source;

a second FET having a source, a gate coupled to said drain of said first FET, and a drain coupled to a positive voltage;

a level shifting circuit; and

a feedback resistance in series with said level-shifting circuit, said source of said second FET being coupled to said gate of said first FET through said level-shifting circuit and said feedback resistance to provide a negative feedback to said first FET; and

an output stage coupled to said source of said second FET, and having a transmission line output which is lower in impedance than the output impedance of said second FET, said output stage serving as a low capacitance buffer between the low impedance of said transmission line output and the relatively higher output impedance of said second FET.

4,075,577
ANALOG-TO-DIGITAL CONVERSION APPARATUS

Ernest Lee Walker, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,150

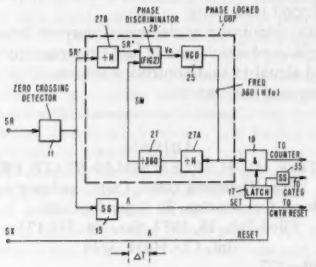
Int. Cl.² H03B *3/04*

U.S. Cl. 331—17 **5 Claims**

1. In a frequency multiplication circuit having a continuously running VCO (voltage controlled oscillator), arranged in a phase locked loop controlled by a phase discriminator, for producing clock oscillation signals at a pedetermined harmonic of the frequency of recurrence of a cyclic reference signal — said clock oscillations being used intermittently for developing an encoded digital count representative of an analog magnitude, over discrete interval segments of a cycle of said reference input — the improvement comprising:

means in said phase discriminator for constraining variations in the VCO control input, during said discrete interval segments of said cycle, to a predetermined form giving

rise to invariably nullifying error contributions to said magnitude representation; said constraining means offsetting lock and capture properties of said loop from a desired norm; and



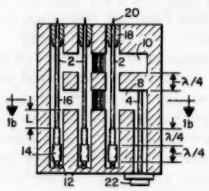
means associated with inputs to said phase discriminator for compensating for said lock and capture offset caused by the introduction of said constraining means.

4,075,578

ACCUMULATING CAVITY MICROWAVE OSCILLATOR

Michael Dydyk, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 21, 1977, Ser. No. 789,463
Int. Cl.[2] H03B 7/14
U.S. Cl. 331—56 **11 Claims**



1. In a microwave oscillator circuit including a plurality of coaxial circuits, each of the coaxial circuits having a first and a second end, a negative resistance diode being positioned at the first end of each coaxial circuit and a matched terminating load being positioned at the second end of each coaxial circuit, an output signal being coupled from each of the plurality of coaxial circuits at points intermediate the diodes and loads, the combination comprising:

first cylindrical cavity means for accumulating power from the plurality of output signals from the plurality of coaxial circuits, said first cavity means having a resonant frequency, f_o and a central axis; and

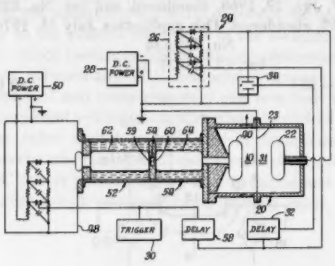
at least one coupling means for coupling said accumulated output signal power from said first cavity means, said at least one coupling means being coupled to said first cavity means remote from said central axis of said first cavity means.

4,075,579

GASEOUS LASER MEDIUM AND MEANS FOR EXCITATION

Robert O. Hunter, Jr., Irvine, and Craig N. Howton, San Diego, both of Calif., assignors to Maxwell Laboratories, Inc., San Diego, Calif.

Filed Dec. 22, 1975, Ser. No. 643,508
Int. Cl.[2] H01S 3/22
U.S. Cl. 331—94.5 G **33 Claims**



1. In a gas laser system, apparatus comprising

means defining a laser chamber containing a mixture of noble gas and a molecular gaseous laser medium,

said laser medium being relatively efficiently photodissociable by vacuum ultraviolet radiation to produce particles having an upper laser state from which they undergo transition to a lower laser state by laser action emitting pulses of coherent radiation of wave length longer than vacuum ultraviolet,

said noble gas, when excited to a predetermined energy level, radiating vacuum ultraviolet radiation of frequency effectively photodissociating said medium to produce said particles in said excited state, and

said laser medium being at a partial pressure a small fraction of the partial pressure of said noble gas, and

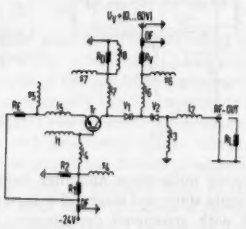
electrical means coupled to said noble gas for producing electronic pulses in said mixture for exciting said noble gas to said predetermined energy level.

4,075,580

MICROWAVE TRANSISTOR OSCILLATOR FOR WIDE BAND FREQUENCY TUNING

Anton Sunkler, Otterfing, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 17, 1976, Ser. No. 742,665
Claims priority, application Germany, Dec. 18, 1975, 2557134
Int. Cl.[2] H03B 5/18
U.S. Cl. 331—96 **9 Claims**



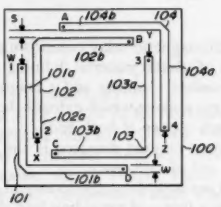
1. In a transistor oscillator for operation in a microwave frequency range having a transistor with a d.c. feedback means connected to the collector, a series connection of a capacitor and line element connected to the collector, and biasing means connected to the base, collector and emitter, wherein the improvement comprises the d.c. feedback means being pro-

vided as an attenuation network means for frequency selective action, the attenuation network means including a first λ/4 line element portion connected to a parallel circuit of an attenuation resistor and a second short-circuited line element portion connected in parallel thereto, a third no-load λ/4 line element portion being connected to the junction of the first line element portion and the parallel circuit and where λ represents the wavelength of oscillation in a middle of the microwave frequency range.

4,075,581
STRIPLINE QUADRATURE COUPLER

Allen Loy Davidson, Crystal Lake, and Ronald Joseph Wanat, Elgin, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed June 1, 1976, Ser. No. 691,683
Int. Cl.[2] H01P *5/18*
U.S. Cl. 333—10 **4 Claims**



1. A 4-input/4-output port radio frequency coupler comprising:

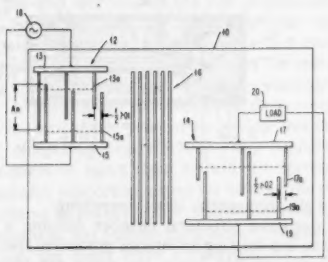
a dielectric substrate material; and

four quarter wave length hybrid couplers comprising a plurality of four conductive paths formed on the substrate, each path having adjacent first and second legs with an input port at the end of one leg and an output port at the end of the other leg, the conductive paths being of predetermined configuration such that the legs of each path electromagnetically couple to legs of a different path to form said four hybrid couplers, the interconnecting lengths between connected coupers all being substantially zero.

4,075,582
SURFACE ACOUSTIC WAVE DEVICE

Ernest L. Walker, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 14, 1976, Ser. No. 696,095
Int. Cl.[2] H03H *9/04, 9/26, 9/32*
U.S. Cl. 333—72 **9 Claims**



1. A surface acoustic wave filter device comprising:

a piezoelectric substrate capable of propagating surface acoustic waves therein;

an input and an output transducer located on said substrate, each having first and second comb shaped elements in which the teeth or electrodes are interleaved and are of a given respective width and spacing to provide respective different characteristic frequency responses from said transducers;

means for determining the lengths of the electrodes thereby determining the amount of overlap of interleaved electrodes in each of the input and output transducers in accordance with a weighting function determined by the Fourier transformation of the characteristic frequency response to said input and output transducers to produce a pair of frequency passbands for each of said transducers symmetrical about their respective center characteristic frequencies and having a passband of each of said pair of frequency passbands overlapping;

means for energizing said input transducers so as to produce a pair of responses at the frequencies of said input transducer frequency passbands respectively;

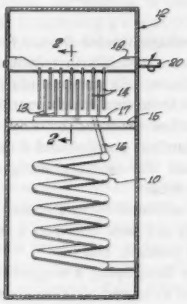
coupling means located on said substrate between said input and output transducers for receiving, transforming and retransmitting said pair of responses from said input transducer to said output transducer;

the cascading of the pairs of responses in said output transducer producing a response at the frequencies of the overlapping passbands from said output transducer.

4,075,583
LOW LOSS TUNEABLE FILTER

Joseph E. Kershaw, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1976, Ser. No. 689,417
Int. Cl.[2] H03H *7/10*
U.S. Cl. 333—73 R **3 Claims**



1. A low loss tuneable RF filter capable of being continuously tuned over a frequency range of at least 2:1 comprising:

a. an enclosed housing forming a shield,

b. a helical coil resonator positioned in one end of said housing,

c. a variable capacitor having a rotor and a stator positioned in the other end of said housing,

d. one end of said helical coil being electrically connected to said housing at a point intermediate the end of said housing in which said variable capacitor is positioned and the end of said housing in which said helical is positioned, the other end of said helical coil being electrically connected to the stator of said variable capacitor,

e. the rotor of said varible capacitor being mounted on a shaft supported by opposing walls of said housing and being electrically connected to said housing to provide optimum Q for said helical coil resonator, and

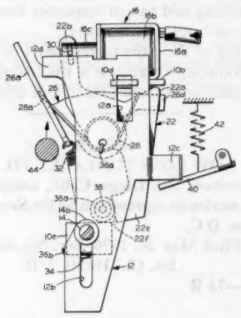
f. said rotor and stator being dimensioned to provide said rotor with a uniform width that is wider than said stator and establishing a constant overlap as the rotor is rotated for tuning said filter over said frequency range.

4,075,584

UNDERVOLTAGE RELEASE DEVICE FOR CIRCUIT BREAKERS

Roger N. Castonguay, Bristol, and Charles L. Jencks, Avon, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Oct. 6, 1976, Ser. No. 730,147
Int. Cl.[2] H01H *83/00*
U.S. Cl. 335—20 **12 Claims**



1. An undervoltage release device for tripping an electric circuit breaker automatically in response to an abnormal undervoltage condition, said device comprising, in combination:

A. a frame for mounting attachment to a circuit breaker;

B. a trip member mounted by said frame for movement between a latched position and a circuit breaker tripping position, said trip member being spring-biased to said tripping position;

C. a solenoid mounted by said frame, said solenoid having

1. a plunger movable between a seated position and an extended position, and

2. a coil for developing a magnetic force sustaining said plunger in its seated position under normal line voltage conditions;

D. a latch member linked to said plunger and mounted by said frame for movement from a first position latching said trip member in its latched position and a second position in response to movement of said plunger from its seated position to its extended position, thereby releasing said trip member for movement to its tripping position;

E. a first spring calibrated to overpower the magnetic force of said solenoid in the event of an abnormal undervoltage condition such as to move said plunger to its extended position and said latch member to its second position;

F. a reset member mounted by said frame for movement from a normal position to a reset position;

G. a second spring positioned to be charged by movement of said reset lever to its reset position, said charged second spring biasing said plunger to its seated position; and

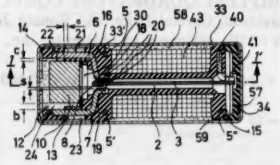
H. means carried by said trip and latch members for inhibiting movement of said plunger to its seated position under the bias of said second spring until said trip member is fully returned from its tripping position to its latched position, whereupon said second spring abruptly discharges to snap said plunger to its seated position and said latch member to its first position.

4,075,585

ELECTROMAGNETIC RELAY AND THE MANUFACTURE THEREOF

Hans Sauer, Fichtenstrasse 5, 8024 Deisenhofen, Germany, assignor to Matsushita Electric Works, Ltd., Osaka, Japan and Hans Sauer, Deisenhofen, Germany, part interest to each

Filed Dec. 10, 1975, Ser. No. 639,406
Claims priority, application Germany, Dec. 13, 1974, 2459039
Int. Cl.[2] H01H *51/22*
U.S. Cl. 335—78 **47 Claims**



1. An electromagnetic relay comprising:

a. a bobbin of plastic material defining therein a protective tube, a contact chamber and a magnet chamber that together form a space which extends the entire length of the bobbin and is open at both ends,

b. a permanent magnet disposed in the magnet chamber to seal one end of said space,

c. a contact actuator mounted to extend along the protective tube with a free end extending into the contact chamber,

d. a pair of pole shoes each having a first end disposed in proximity to the permanent magnet and a second end extending into said contact chamber, said second ends forming fixed contacts for cooperation with said free end of the contact actuator,

e. a coil mounted on the bobbin,

f. means activatable as a getter and disposed in said space, and

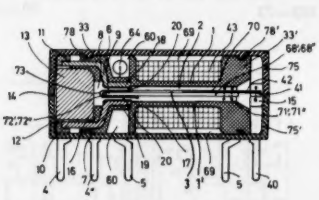
g. a closure sealing the other end of said space opposite said permanent magnet.

4,075,586

ELECTROMAGNETIC RELAY

Hans Sauer, Deisenhofen, Germany, assignor to Matsushita Electric Works, Ltd., Osaka, Japan and Hans Sauer, Deisenhofen, Germany, a part interest to each

Filed Feb. 24, 1976, Ser. No. 661,025
Claims priority, application Germany, Feb. 24, 1975, 2507914
Int. Cl.[2] H01H *51/27*
U.S. Cl. 335—79 **15 Claims**



1. An electromagnetic relay comprising:

a. a one-piece structural member defining a longitudinal plane and forming an interior protective space and a bobbin around said space, the space extending the entire length of the member which is open at both ends;

b. a coil mounted on said bobbin;

c. fixed contact means extending into the protective space;

d. a contact actuator mounted in said space to extend along said bobbin and having a free end disposed in proximity to said fixed contact means for cooperation therewith;

e. terminals connected to the coil, the actuator and the fixed contact means, said terminals being embedded in and extending outwardly from said structural member on opposite sides thereof in the longitudinal plane defined by said structural member;

f. an outer protective casing formed of two casing members sealed together generally in said longitudinal plane, said protective casing and said structural member together forming a seal around each said terminal; and

g. means sealing said open ends of said structural member, the sealing means of at least one of said open ends comprising first surfaces formed on said structural member and second surfaces formed on said casing members, said first and second surfaces mutually cooperating with each other.

4,075,587

MULTICONTACT SEALED ELECTROMAGNETIC COORDINATE SELECTION DEVICE

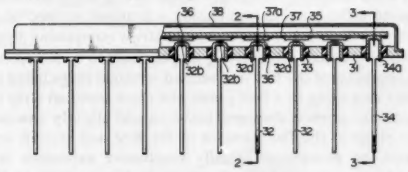
Hideo Suzuki; Ginya Ishiguro; Sadayuki Mitsuhashi, and Kazutoshi Wakamatsu, all of Tokyo, Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Nippon Electric Co., Ltd., both of Tokyo, Japan

Filed Oct. 12, 1976, Ser. No. 731,315

Claims priority, application Japan, Oct. 23, 1975, 50-127827; Nov. 12, 1975, 50-135841; Nov. 12, 1975, 50-135842

Int. Cl.[2] H01H *67/14*

U.S. Cl. 335—112 **19 Claims**



1. A multicontact sealed electromagnetic coordinate selection device comprising a metal plate having holes therein arranged in at least one line; stationary contact terminal means, one end portion of which penetrates the corresponding hole in said metal plate and which includes a stationary contact formed on the end face of said one end portion and cores; electrically insulating material for supporting stationary contact terminal means on the metal plate and electrically insulating said contact terminal means from the metal plate; magnetic flux path-forming means including a movable contact type spring having movable contacts facing the corresponding stationary contacts with a prescribed spacing therebetween, said spring comprising arms for elastically supporting the movable contacts to move them toward the corresponding movable contacts; supporting means for holding the magnetic flux path-forming means in parallel relationship with the metal plate, said magnetic flux path-forming means being electrically insulated from the metal plate; a container for sealing the magnetic flux path-forming means and stationary contacts; closed magnetic flux path-forming means for providing a closed magnetic flux path in cooperation with the core and magnetic flux path-forming means; and windings for selectively exciting a magnetic flux in said closed magnetic flux path.

4,075,588

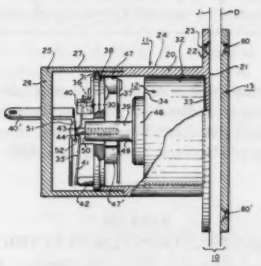
SWITCHING APPARATUS

Nathan Verger, Great Neck, and Gerhard Schmidt, Rego Park, both of N.Y., assignors to Alarm Device Manufacturing, Co., Syossett, N.Y.

Continuation of Ser. No. 414,442, Nov. 9, 1973, abandoned, which is a continuation of Ser. No. 285,353, Aug. 31, 1972, abandoned. This application Nov. 5, 1975, Ser. No. 628,849

Int. Cl.[2] H01H *36/00*

U.S. Cl. 335—207 **9 Claims**



1. An apparatus for making and breaking connections in an electrical circuit, comprising:

a. a first contact;

b. a second contact;

c. means for positioning the second contact opposite the first contact;

d. a magnet which is magnetized such that opposite faces thereof define poles of opposite polarity;

e. means for connecting the magnet to the second contact positioning means comprising a connector secured to the magnet at the end thereof of the first pole and the resilient support arm at the other end thereof,

f. means for moving the magnet and the second contact to a position where the second contact breaks contact with the first contact comprising a metal plate positionable opposite a first pole of the magnet;

g. means for moving the magnet and the second contact to a position where the second contact makes contact with the first contact comprising a further metal plate positionable opposite a second pole of the magnet; and

h. a housing, in which the second contact positioning means comprises a resilient support arm extendable into the housing at a location therein adjacent the first contact, and in which the magnet is reciprocally movable in the housing, in which the first contact is mounted in one end of the housing, and in which the metal plate positionable opposite a first pole of the magnet is hollow, is mounted in the housing intermediate the first and second contacts and the magnet, and through which the connector extends.

4,075,589

MAGNETIC PLATE COMPRISING PERMANENT MAGNETS AND ELECTROPERMANENT MAGNETS

Philibert Maurice Braillon, 2, rue d'Alexandry, Chambery, Savoie, France

Filed Dec. 3, 1976, Ser. No. 747,206

Claims priority, application France, Dec. 4, 1975, 75 37873

Int. Cl.[2] H01F *7/20*

U.S. Cl. 335—286 **8 Claims**

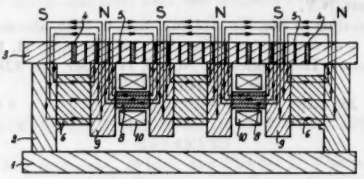
1. A magnetic holder comprising a hollow body having:

a pair of opposite walls of soft magnetic material;

a sole plate underlying said body and in contact with said walls, said sole plate composed of soft magnetic material;

a magnetic stack bridging said walls and in contact therewith, said magnetic stack comprising alternating high-coercive force magnets and low-coercive-force magnets

with soft magnetic pole pieces disposed between them, said pole pieces being spaced above said sole plate; and electric coils surrounding each of said low-coercive force



magnets, said high-coercive-force magnets being of invariable magnetic direction and the magnetic direction of said low-coercive-force magnets being reversible by the application of electrical pulses to said coils.

4,075,590

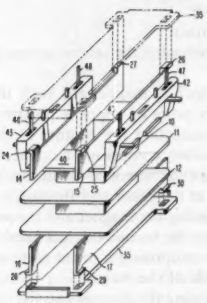
BOBBIN CONSTRUCTION FOR ELECTRICAL COILS

Stephen Foldes, 5 Riverside Drive, Binghamton, N.Y. 13905

Filed Feb. 22, 1977, Ser. No. 770,573

Int. Cl.[2] H01F *27/26*

U.S. Cl. 336—192 **2 Claims**



1. A bobbin construction, particularly for electrical coils having cores of ferromagnetic laminations, comprising a hollow skeletal frame member of molded plastic material over which a coil may be wound, said member having laterally extending walls defining the space for said coil and, at each end, a pair of axially-extending walls defining the space for said laminations, one of said lateral walls having axially-extending portions supporting terminal lugs for the electrical connection of said coil, said axially-extending walls having protuberant parts adapted to secure a cover member, comprising an oblong piece of flexible material having cutouts so dimensioned as to cooperate with said protuberant parts in a snap fastener mode of retention.

4,075,591

PRINTED CIRCUIT COILS

Dieter Haas, Hildesheim, Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Germany

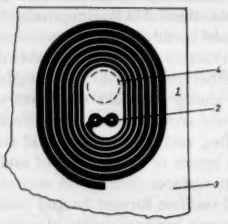
Division of Ser. No. 686,520, May 14, 1976, Pat. No. 4,016,519.

This application Jan. 31, 1977, Ser. No. 763,852

Int. Cl.[2] H01F *27/28*

U.S. Cl. 336—200 **2 Claims**

1. A printed circuit coil of spiral configuration formed on a surface plate of insulating material providing substantially all of the inductance of a resonant circuit and composed of a layer of conducting material in a continuous spiral path providing a plurality of coil turns with a substantially constant spacing between adjacent turns and further having the improvement



that the path width is not uniform and decreases from the outside turn to the inside turn.

4,075,592

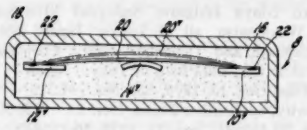
ELECTRICAL LOAD OUTAGE DETECTOR

Thaddeus Schroeder, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 1, 1977, Ser. No. 820,411

Int. Cl.[2] H01H *71/18*

U.S. Cl. 337—139 **2 Claims**



1. An electrical load outage detector comprising first, second and third terminal strips secured together in a rigid assembly with insulating material therebetween, each terminal strip having a flat portion comprising a terminal connector at one end, the first and second terminal strips comprising input and output terminals respectively connectable to a load circuit, the flat portions of the first and second terminal strips being spaced apart and lying in a first plane, the third terminal strip having a contact portion disposed between and slightly spaced from the plane of the flat portions of the first and second terminal strips, an elongate thermally responsive expansion strip of conductive material fixedly connected at its ends to the flat portions of the first and second terminal strips to prevent longitudinal movement of the said ends and for electrically interconnecting the first and second terminal strips to carry load current therebetween, the expansion strip when unheated being slightly bowed and stressed into firm engagement with the contact portion of the third terminal strip to electrically interconnect the first, second and third terminal strips, the expansion strip having sufficient resistance to be significantly heated by the load current for longitudinal expansion when heated by load current flow to effect further bowing of the expansion strip and consequent movement away from engagement with the contact portion of the third terminal strip thereby electrically disconnecting the third terminal strip from the first and second terminal strips.

4,075,593

ROTATABLE SHAFT POSITIONING MEANS

Willi K. Beck, Hingham, Mass., assignor to King-Seely Thermos Co., Ann Arbor, Mich.

Division of Ser. No. 557,012, March 10, 1975, which is a continuation of Ser. No. 127,341, March 23, 1971, abandoned.

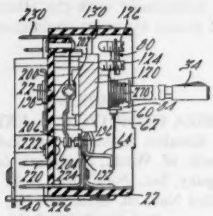
This application July 23, 1976, Ser. No. 708,192

Int. Cl.[2] H01H *61/08*

U.S. Cl. 337—312 **18 Claims**

10. A thermal controller for controlling electrical energy

being supplied to an oven having both a cooking range of temperatures and at least one self-clean temperature comprising a support housing assembly, an operation selector assembly including a shaft supported in said housing for rotational and axial movement relative to said housing, a first set of contacts operable to control electrical energy being supplied to said oven within said cooking range of temperatures, a second set of contacts operable to control electrical energy being supplied to said oven during an operation at said self-clean temperature,



resilient means for biasing said shaft in a first axial direction relative to said housing, a detent member axially and rotatably fixed to said shaft, and shoulder means fixedly supported relative to said housing adjacent said detent member, said detent member engaging said shoulder during a predetermined arc of rotation of said shaft and axial movement of said shaft in a direction opposite to said first direction, said detent member and said shoulder coacting to rotatably fix said shaft relative to said housing thereby positioning said second set of contacts in operable position.

4,075,594

THERMOSTAT WITH RESET ARM

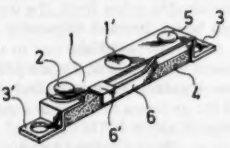
Uchiya Tomoyoshi, Misato, Japan, assignor to Uchiya Co., Ltd., Misato, Japan

Filed Aug. 16, 1976, Ser. No. 714,400

Claims priority, application Japan, Aug. 15, 1975, 50-112946[U]

Int. Cl.[2] H01H *37/54*

U.S. Cl. 337—348 **1 Claim**



1. A thermostat comprising: an elongated frame (4) to define a contact zone having a hollow space therein; first and second terminals (3', 3) at each end of said zone; an elongated contact arm (1) stretched across said zone clamped (5) at one end to said first terminal (3), said other end having a contact (2) thereat in opposed relation to said first terminal (3') to make electric contact therewith; a curved bimetal strip (7) extending across said hollow space between said contact arm (1) and said frame (4) biased normally towards said frame but curving against said contact arm (1) and pushing said contact (2) away from said first terminal (3') when heated; a reset arm (6) extending from the vicinity of said second terminal (3) to said first terminal (3') with a flat section disposed alongside said frame (4) and a curved resilient section curved away from said frame (4) but biased to spring towards said frame; and, a flat free end (6') on said reset arm (6) disposed to enter the space between said contact arm (1) and said frame (4) but prevented from so doing by said contact arm being in contact (2) with said first terminal (3') but said free end (6') entering said space when said contact arm (1) is pushed away by said bimetal strip (7), said free end (6') then preventing said contact (2) from again contacting said first terminal (3') until said free end (6') is forcibly removed from the space between the contact arm and the frame.

4,075,595

TEMPERATURE RESPONSIVE ELECTRICAL SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME

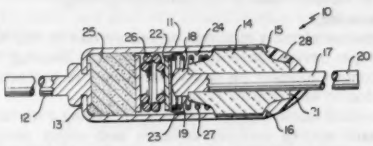
Emil Robert Plasko, Washington Township, Montgomery County, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 471,851, May 21, 1974, Pat. No. 4,001,754. This application Aug. 23, 1976, Ser. No. 716,807

The portion of the term of this patent subsequent to Jan. 4, 1994, has been disclaimed.

Int. Cl.[2] H01H *37/36*

U.S. Cl. 337—407 **18 Claims**



1. In a collapsible pellet thermal limiter construction having electrical switching means that changes its condition when said pellet melts by being heated to a certain temperature for the particular pellet and having an epoxy material sealing one end of a casing of said construction, the improvement comprising filler material in said epoxy material in the order of approximately 4% to approximately 6% by weight of said epoxy material whereby said filler material improves the effective seal life of said epoxy material, said pellet having a particular melting temperature of approximately 200° F. or lower or of approximately 370° F. or higher.

4,075,596

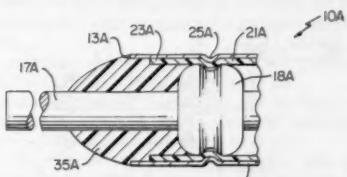
SEALED CASING FOR A THERMALLY ACTUABLE ELECTRICAL SWITCH

Emil Robert Plasko, Washington Township, Montgomery County, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 23, 1976, Ser. No. 716,806

Int. Cl.[2] H01H *37/76*

U.S. Cl. 337—408 **5 Claims**

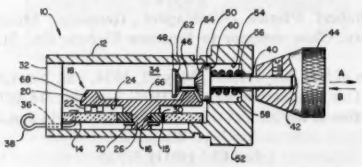


1. In a thermally actuatable electrical switch construction having a conductive open ended casing receiving an insulating sleeve in the open end thereof and a lead carrying insulating end plug disposed within said sleeve to close said open end, the improvement wherein said sleeve is disposed completely within said casing and inboard of the open end of said casing, and comprising a sealing means sealing said casing to said sleeve external to said sleeve and said casing.

4,075,597
VARIABLE RESISTOR WITH DUAL RATIO INPUT SHAFT

Leslie Thomas Peart, Santa Ana, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 20, 1976, Ser. No. 752,347
Int. Cl.[2] H01C *10/16*
U.S. Cl. 338—128 **13 Claims**

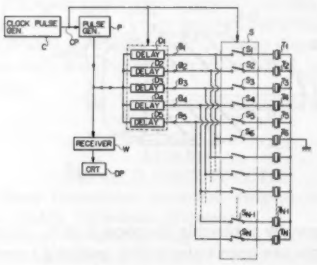


1. A variable resistor apparatus comprising:
a housing;
a resistor element mounted on one surface in said housing;
a wiper device rotatably mounted in said housing;
a contact member on said wiper device in contacting relation to said resistor element;
a control member positioned in said housing with one end of said control member adjacent said wiper device, said control member movable to move said contact member relative said resistor element;
a first drive surface positioned on said one end of said control member;
a second drive surface positioned on said one end of said control member in spaced relation to said first drive surface, one of said first and second drive surfaces being closer to the center of said wiper device than the other of said first and second drive surfaces; and
means on said wiper device acting in selective cooperation with one of said first and second drive surfaces for changing the ratio of movement of said contact member with respect to a constant movement of said control member.

4,075,598
ULTRASONIC WAVE TRANSMITTING AND RECEIVING APPARATUS

Kinya Takamizawa, Yokohama; Einoshin Itamura, Tokyo, and Kazuhiro Iinuma, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 21, 1976, Ser. No. 678,758
Claims priority, application Japan, Apr. 25, 1975, 50-50350
Int. Cl.[2] G01S *9/66*
U.S. Cl. 340—1 R **12 Claims**

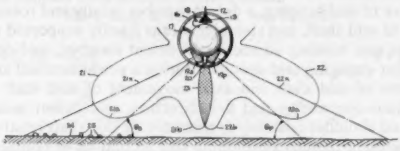


1. An ultrasonic wave transmitting and receiving apparatus comprising an N number of electro-acoustic conversion elements arranged on a flat plane, selectively connecting means for successively energizing each of an M (M<N) number of electro-acoustic conversion elements to transmit ultrasonic waves, means for deflecting ultrasonic wave beam transmitted from said M number of electro-acoustic conversion elements by relatively delaying the input supplied to the M number of elements so that the ultrasonic wave beams emitted respectively from said electro-acoustic conversion elements may be substantially deflected and scanned to such an extent that the centers of the beams do not intersect each other within a range of field to be examined, means for generating an electric signal in accordance with the received ultrasonic wave reflected from an object within the range of field, and means for displaying images in accordance with the electric signal from said last-mentioned means by using equidistant and parallel scanning lines.

4,075,599
UNDERSEA GEOPHYSICAL EXPLORATION

James George Kosalos, Kirkland, and Robert William Cooke, Issaquah, both of Wash., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Nov. 30, 1976, Ser. No. 746,184
Int. Cl.[2] G01S *9/66*
U.S. Cl. 340—3 R **10 Claims**



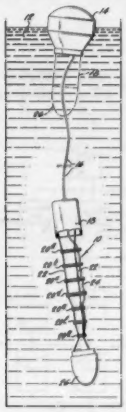
1. A process for geophysical surveying of an undersea floor area to obtain information indicative of physical characteristics of material on the undersea floor comprising:
(a) moving an undersea vehicle under water in a forward linear direction at a substantially constant altitude above the undersea floor;
(b) transmitting bilaterally from said vehicle two underwater acoustic beams, one at a first frequency and the second at a second frequency, both frequencies being in the transmitting frequency range of 12 to 40 kHz and differing from each other by a difference frequency of at least 2 kHz and each with power sufficient to intersect, and produce perceivable echos from, the undersea floor;
(c) said beams being directed bilaterally away from each other, one to the starboard and one to the port, with the acoustic axis of each beam in a plane perpendicular to the forward line of vehicle movement and slanted downward to intersect the undersea floorline at a grazing angle in the angular range of about 20° to 65°;
(d) each of said two beams having a portion extending vertically down to the undersea floor and sideward from the vertical at least about one degree from each side of the downward vertical from the vehicle and forming a downwardly directed difference-frequency beam of at least about two degrees width impinging on the undersea floor;
(e) perceiving underwater vibrations backscattered from where the starboard and port beams impinge on material of the undersea floor;
(f) converting the perceived backscattered vibrations to electric signals indicative of the amplitude of the backscattered vibrations reaching the undersea vehicle;
(g) displaying, storing or recording the amplitudes of the backscattered vibration signals;
(h) perceiving acoustic vibration at the difference-frequency reflected upward from where the difference-frequency impinges on undersea floor material;
(i) converting the perceived difference-frequency vibrations to electric signals indicative of the amplitude of the difference-frequency vibrations; and
(j) displaying, storing or recording the amplitudes of the difference-frequency signals.

4,075,600

DUAL RESONANCE BENDER TRANSDUCER

Claude C. Sims, Orlando, and Thomas H. Ensign, Winter Park, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 10, 1976, Ser. No. 694,623
Int. Cl.[2] H04B *13/00*
U.S. Cl. 340—9 3 Claims



1. An acoustic array having a plurality of resonant frequencies within a preselected bandwidth, comprising, in combination:

a plurality of planar transducer means with selected ones being resonant at only the fundamental frequency thereof, and the others at the fundamental frequency and only one overtone frequency substantially six times the fundamental frequency, all of the fundamental and overtone frequencies being separate and discrete from each other and within said preselected bandwidth; and

coupling means operatively connected to said transducer means for spacing respective ones thereof in coaxial and parallel relation;

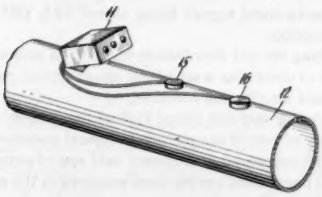
whereby the number of incremental resonance frequencies exceed the number of said transducer means.

4,075,601

COMBINED PIPELINE MARKER AND TEST UNIT

Norman E. Flournoy, Richmond, Va., assignor to Texaco Inc., New York, N.Y.

Filed June 20, 1975, Ser. No. 588,928
Int. Cl.[2] H04B *11/00*
U.S. Cl. 340—15 1 Claim



1. A combined pipeline marker and self test unit, comprising in combination

a pipeline

a first piezoelectric crystal bonded to said pipeline for emitting an acoustic marker signal having a predetermined frequency,

a low power oscillator for driving said first crystal comprising

a CMOS integrated circuit having six inverting buffers,

circuit means including a capacitor and two resistors connected to a pair of said buffers for producing said predetermined frequency oscillation,

three of said buffers being connected in parallel to drive said first crystal, and

one of the said buffers being connected between said oscillation pair and said three drive buffers to isolate said oscillation pair,

a second piezoelectric crystal bonded to said pipeline adjacent to said first piezoelectric crystal for detecting the presence of said marker signal,

a low power amplifier for amplifying signals generated by said second crystals, comprising

an integrated circuit amplifier,

a discrete transistor connected to the output of said integrated amplfier, and

filter means for connecting said second crystal to said integrated amplifier for tuning it to said predetermined oscillation frequency,

a light emitting diode connected to the output of said transistor for indicating presence of said marker signal, and

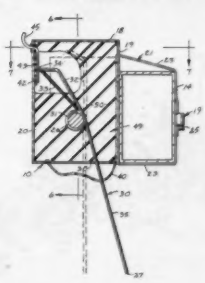
push button switch means for manually energizing said low power amplifier to test said marker operation.

4,075,602

LOW TIRE ALARM

Darrell S. Clothier, 744 6th Avenue W Kalispell, Mont.

Filed Aug. 4, 1976, Ser. No. 711,501
Int. Cl.[2] B60C *23/08*
U.S. Cl. 340—58 6 Claims



1. A low tire alarm for warning the operator of a forwardly moving vehicle of the type having one or more axle supported ground engaging pneumatic tires that one or more of the tires is at least partially deflated, said alarm comprising:

a hollow housing;

clamp means on the housing adapted to mount the housing to a vehicle axle directly adjacent a ground engaging tire thereof;

a shaft extending through the housing and substantially parallel with the axis of rotation for the tire;

an elongated electrically conductive rod having a coiled central portion wrapped loosely about the shaft such that the rod will pivot freely about the shaft axis;

wherein the rod includes an integral swing arm portion within the housing that protrudes from the coiled portion;

said swing arm including an electrical contact surface at a free end thereof movable with the swing arm in an arcuate path about the shaft axis;

said rod further including an integral feeler arm portion protruding from the coiled portion through an aperture in the housing to a free ground sensing end that is outside the housing;

an electrically conductive pad;

an insulator mounting the pad within the housing in the path of the electrical contact surface;

said rod further including an integral spring member engage-

able with the housing to resist pivotal movement of the electrical contact surface toward the electrically conductive pad;

an insulative foam resilient seal means for hermetically sealing the interior of the housing to seal the housing and keep the electrically conductive pad dry while enabling the rod to pivot about the shaft axis;

a conductor wire connected to the pad;

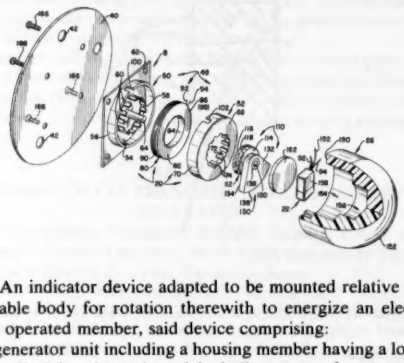
signal producing means connected to the conductor wire and adapted to be electrically connected to a grounded source of electrical energy for producing a signal when the free ground sensing end of the rod engages the ground and causes the rod to pivot about the shaft axis against the resistance of the integral spring member and swing the electrical contact surface of the swing arm into contact with the electrically conductive pad.

4,075,603

APPARATUS AND METHOD FOR INDICATING CONDITION OF A ROTATING BODY

Daniel S. Snyder, Norwalk, and Steven O. Luzsicza, Huron, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Oct. 4, 1976, Ser. No. 728,928
Int. Cl.[2] B60C *23/04*
U.S. Cl. 340—58 **38 Claims**



1. An indicator device adapted to be mounted relative to a rotatable body for rotation therewith to energize an electrically operated member, said device comprising:

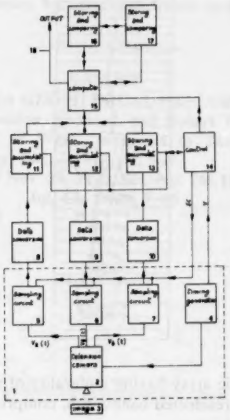
a generator unit including a housing member having a longitudinal housing axis and including means for mounting said housing to said body in a manner such that said longitudinal housing axis is fixedly disposed generally normal to the plane of said rotatable body, a stator component including an associated field winding and a rotor component with said stator and rotor components disposed in said housing generally coaxial with said housing axis in spaced apart operative communication with each other, one of said stator and rotor components being mounted for independent rotation about said housing axis with the other of said stator and rotor components being stationarily affixed to said housing, said one component including means for maintaining it in a generally stationary disposition when said housing is mounted to a rotatable body and rotated about the axis of said body whereby relative rotation is obtained between said stator and rotor components solely by the influence of rotation of said body with said relative rotation causing a voltage to be induced in said field winding; and, an electrically operated member connected to said field winding and energized by said voltage.

4,075,604

METHOD AND APPARATUS FOR REAL TIME IMAGE RECOGNITION

Mario Marco Degasperi, Milan, Italy, assignor to Tasco S.p.A., Milan, Italy

Filed Jan. 25, 1977, Ser. No. 762,423
Claims priority, application Italy, Feb. 23, 1976, 20452/76
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 AG **17 Claims**



1. A method for real time recognition of a test image supported on a background by comparison with known sample images, and selection of the sample image showing the least difference, comprising the steps of:

(a) preparing and storing for reference a plurality of sets of sample typical parameters, each set of typical parameters derived from the luminance of an individual known sample image;

(b) reading said test image on said background with a scanning device to produce a plurality of test signals proportional to the levels of luminance of said test image and said background;

(c) separating said test signals into discrete accumulations of signals having the same luminance level;

(d) eliminating from said plurality of test signals those signals produced from reading of said background;

(e) preparing from said separated test image signals a distribution function having luminance levels for one axis and frequency of occurrence of test image signals for the other axis, background signals being absent from said distribution function;

(f) operating on said distribution function of said test image signals to determine a set of test image typical parameters from said distribution function;

(g) comparing said test image typical parameters with said plurality of sets of sample image typical parameters, each set being compared in sequence, said sets of sample image typical parameters having been prepared in the manner of steps (b) to (f);

(h) selecting the one set of sample image typical parameters which in said comparison indicates the least difference with said set of test image typical parameters;

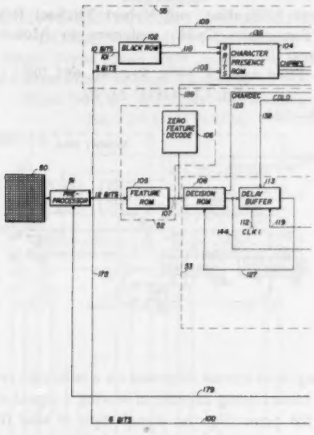
(i) comparing said least difference with a threshold value of difference; and

(j) generating a signal indicating the sample image providing said least difference when said least difference is less than said threshold value of difference.

4,075,605
CHARACTER RECOGNITION UNIT

Larry L. Hilley, Garland, and Marion W. Neff, Arlington, both of Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.

Filed Sept. 13, 1974, Ser. No. 505,931
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 AC **12 Claims**

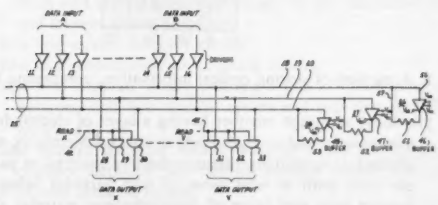


1. In an automatic optical pattern recognition system, the method which comprises scanning a two-dimensional array of photosensors in a raster-like ordered sequence at a scan rate high compared to relative movement between a field of information and said array, processing binary video data flowing from said array at said scan rate without intermediate storage to produce representative feature codes for each scan, applying said feature codes from a complete scan of said array to a distributed flow sequential network, processing said feature codes by a one step state transfer to any logical node in said network to generate a character code representative of a unique relationship between said sequence of feature codes, and identifying a pattern from a stream of character codes produced from repetitive scanning of said array while said pattern is in registration with said array.

4,075,606
SELF-MEMORIZING DATA BUS SYSTEM FOR RANDOM ACCESS DATA TRANSFER

Richard W. Wilkens, Largo, Fla., assignor to E-Systems, Inc., Dallas, Tex.

Filed Feb. 13, 1976, Ser. No. 657,828
Int. Cl.[2] G11C *11/40*; H04Q *9/00*
U.S. Cl. 340—147 B **6 Claims**

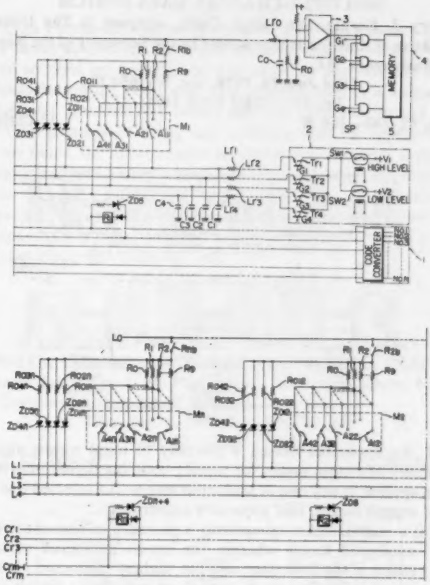


1. In a data bus system, the combination comprising:
a. a bus conductor for transferring electrical signals:
b. at least one input device connected to said bus for generating multi-state electrical signals indicative of data information;
c. at least one output device connected to said bus conductor, said output device being operable, at random, to read said electrical signals from said bus conductor; and
d. at least one non-inverting buffer having an input lead and an output lead, said input and said output leads being connected together to form a feedback loop and to said bus conductor to permit said buffer to be driven by said input device and to latch said buffer at the state of the last generated of said electrical signals when said buffer is not driven by said input device.

4,075,607
SYSTEM FOR COLLECTING DATA FROM METERS PLACED AT REMOTE PLACES

Takeshi Abe, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1976, Ser. No. 744,186
Claims priority, application Japan, Nov. 25, 1975, 50-140987
Int. Cl.[2] G08C *15/08*
U.S. Cl. 340—152 R **5 Claims**



1. In a data collection system of the type comprising a plurality of counter-meters installed at remote places, a data collection station for reading data from said countermeters, a plurality of transmission lines interconnected between said countermeters and said data collection station and comprising one common data transmission line and a plurality of other data transmission lines equal in number to the number of digits of each counter-meter, each counter-meter having a plurality of resistors equal in number to the number of digits of the counter-meter, each resistor being coupled between the corresponding counter-meter and one of said transmission lines to indicate a value at a corresponding digit position, said data collection station including means for sequentially sampling said counter-meters to read and collect the data of each counter-meter through said transmission lines,
the improvement comprising:
a voltage threshold element interconnected between said common data transmission line and each of said other data transmission lines corresponding to each digit to be read out, said voltage threshold element being connected in parallel with said resistors of each counter-meter, said

threshold element exhibiting a dynamic impedance substantially less than that of each of said resistors when subjected to a predetermined high-level voltage, and a resistance substantially greater than that of each of said resistors when subjected to a predetermined low-level voltage,

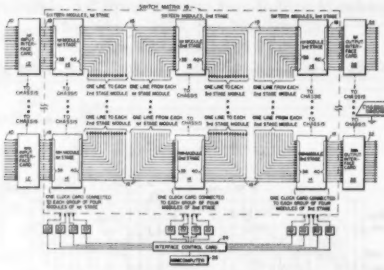
means for applying said high-level voltage between said common data tranmission line and a selected one of said other data transmission lines to cause a relatively high current to flow through said voltage threshold element to charge stray capacitance between said common data transmission line and said selected other data transmission line and between each of said lines and ground, and

means for thereafter applying said predetermined low-level voltage between said selected data transmission line and said common data transmission line to cause current to flow through a corresponding one of said resistors of said counter-meter so that the corresponding digit value may be determined at said station.

4,075,608
MULTIPLE-CHANNEL DATA SWITCH

Harry J. Koenig, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 19, 1976, Ser. No. 650,104
Int. Cl.[2] H04Q *9/00*; H04J *3/00*
U.S. Cl. 340—166 R **12 Claims**



1. An apparatus having a plurality of input means and a plurality of output means for rapidly coupling digital information applied to any one of said input means to a selected one of said output means, said apparatus comprising:

(a) a matrix means comprising a plurality of consecutively numbered stages wherein the lowest numbered of said stages is the first stage and the highest numbered of said stages is the final stage, each stage including a plurality of switching element means, each of said switching element means having a plurality of element input means and a plurality of element output means, each of said switching element means for coupling digital information applied to one of its said element input means to a selected one of its said element output means in response to a control signal;

(b) an input coupling means for coupling said plurality of input means of said apparatus to the element input means of the switching element means of said first stage;

(c) an element coupling means for coupling the element output means of the switching element means of each stage except said final stage to the element input means of the switching element means of the next-highest-numbered stage;

(d) an output coupling means for coupling said plurality of output means of said apparatus to the element output means of the switching element means of said final stage;

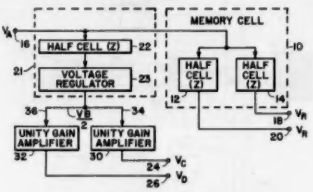
(e) a control means coupled to each of said switching element means of said apparatus for providing a control signal to each of said switching element means;

(f) instruction means coupled to said control means for instructing said control means to provide a control signal to a selected one of said switching element means in each of said stages for configuring a transmission channel for digital information from any one of said input means of said apparatus to a selected one of said output means of said apparatus.

4,075,609
ON-CHIP VOLTAGE SOURCE FOR INTEGRATED CIRCUITS

Michael Scott Millhollan, and Robert Michael Reinschmidt, both of Sunnyvale, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 29, 1976, Ser. No. 681,298
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—154 **8 Claims**

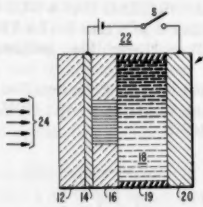


1. An integrated circuit disposed on a substrate comprising: first circuit means being capable of storing a signal and including means for providing the signal state of said first circuit means during a sense mode; and second circuit means to generate a reference signal and being coupled to said first circuit means for supplying the reference signal during the sense mode, the reference signal providing an amplitude reference, said first and second circuit means each having an impedance means, each impedance means being substantially identical during said sense mode.

4,075,610
METHOD OF STORING OPTICAL INFORMATION

Richard Seely Crandall, and Brian Wilfred Faughnan, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,399
Int. Cl.[2] G11C *13/02*
U.S. Cl. 365—107 **12 Claims**



1. A method of storing optical information, comprising the steps of:

providing a storage member having a layer of electrochromic material and an electrolyte in contact therewith, said electrolyte containing photoconductive material in particle form with at least some of said particles being in contact with said layer of electrochromic material, said photoconductive material being capable of creating electron-hole pairs when exposed to said optical information; and

exposing said member to said optical information whereby said layer of electrochromic material colors in an area which corresponds to said optical information, said color-

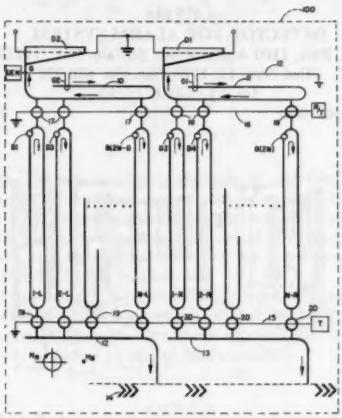
ation occurring solely due to said exposure to said optical information.

4,075,611

CONSECUTIVE BIT ACCESS OF MAGNETIC BUBBLE DOMAIN MEMORY DEVICES

Isoris S. Gergis, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 19, 1975, Ser. No. 633,306
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—2 13 Claims



1. In combination,

first and second generator means capable of operating concurrently to produce information bits,

first and second storage means,

first and second separate access paths for coupling said first and second generator means to said first and second storage means, respectively,

said first access path defining a first access distance between said first generator means and the associated first storage means,

said second access path defining a second access distance between said second generator means and the associated second storage means,

said first and second access distances having a prescribed first difference whereby said first storage means can receive information only from said first generator means and said second storage means can receive information only from said second generator means via the respective first and second access paths,

first and second detector means,

first and second separate coupling means,

said first coupling means defining a first coupling distance between said first storage means and said first detector means, and

said second coupling means defining a second coupling distance between said second storage means and said second detector means,

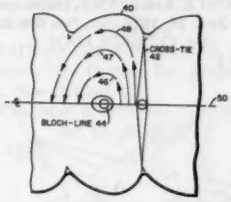
said first and second coupling distances having a prescribed second difference which is related to said prescribed first difference whereby said first detector can receive information only from said first storage means and said second detector means can receive information only from said second storage means via the respective first and second coupling means.

4,075,612

ROUNDED SERRATED EDGE FILM STRIP GEOMETRY FOR CROSS-TIE WALL MEMORY SYSTEM

Leslie Harold Johnson, Minneapolis; David Shih-Fang Lo, Burnsville, and Maynard Carlton Paul, Bloomington, all of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 3, 1977, Ser. No. 756,223
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—171 3 Claims



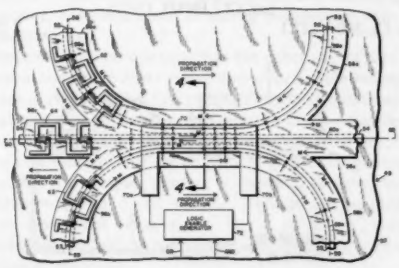
1. In a cross-tie wall memory system in which binary data are stored as inverted Neel wall sections, which inverted Neel wall sections are bounded by a cross-tie on one end and by a Bloch-line on the other end, of a cross-tie wall in a magnetic layer and in which said binary data are generated in and are serially propagated along said cross-tie wall by appropriate drive fields, the improvement in which said magnetic layer is configured into a strip whose two opposing edges are formed into uniformly spaced, repetitive patterns of asymmetrically rounded, serrated edges that match the natural contour of the magnetization that is oriented around a Bloch-line that is positioned along said cross-tie wall.

4,075,613

LOGIC GATE FOR CROSS-TIE WALL MEMORY SYSTEM INCORPORATING ISOTROPIC DATA TRACKS

Ernest James Torok, St. Paul, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 3, 1977, Ser. No. 756,225
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—87 10 Claims



1. A logic gate for a cross-tie wall memory system in which binary data are stored as cross-tie, Bloch-line pairs in a cross-tie wall in a data-track-defining magnetic film strip and in which said binary data are generated in and are serially propagated along said cross-tie wall in said data track by appropriate drive fields, comprising:

first, second and third magnetic film strips, each defining first, second and third data tracks, respectively, and each having a cross-tie wall oriented along its length for supporting cross-tie, Bloch-line pairs, said first, second and third data tracks having an overlapping, merging portion;

first, second and third propagating means associated with said first, second and third data tracks, respectively, for

propagating the cross-tie, Bloch-line pairs in said merging portion of said first, second and third data tracks; and,

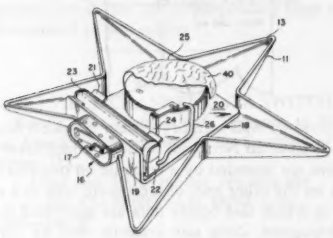
logic enable generator means coupling a logic enable field of a given intensity to said merging portion of said first, second and third logic data tracks for generating in said third data track the logic replica of the cross-tie, Bloch-line pairs in said first and second data tracks.

4,075,614

CHRISTMAS TREE FIRE DETECTOR AND ALARM

Donald A. White, 4701 E. Kessler View, Indianapolis, Ind. 46220

Filed June 16, 1976, Ser. No. 696,483
Int. Cl.[2] G08B *17/06*
U.S. Cl. 340—227.1 **15 Claims**



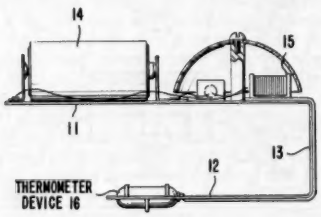
1. A Christmas tree ornament and fire alarm, comprising: a housing having an interior chamber; means for mounting the housing on the upper portion of a Christmas tree; detector means in communication with the environment exterior of the housing for providing a signal in response to a fire within the Christmas tree; means within the interior of said housing for providing an audible fire alarm in response to said signal; and a plurality of openings through said housing for passing the audible fire alarm signal from the interior of said housing to the exterior of said housing.

4,075,615

FREEZER ALARM

Beltran L. Garcia, Kingsville, Tex., assignor to The Raymond Lee Organization, Inc., New York, N.Y., part interest to each

Filed Feb. 25, 1977, Ser. No. 771,920
Int. Cl.[2] H01H *37/74*
U.S. Cl. 340—227.1 **2 Claims**



1. A freezer alarm for a freezer having an opening and a wall at the opening, the wall having an inside surface in the freezer, an outside surface out of the freezer and an edge at the opening between the inside and outside surfaces, said freezer alarm comprising

a bracket member of substantially square U-shaped configuration having first and second spaced substantially parallel arms and a head joining the arms and extending substantially perpendicularly thereto, said bracket member resting on a wall of a freezer at the opening thereof with the first arm abutting the outside surface of the wall, the second arm abutting the inside surface of the wall and the head abutting the edge of the wall;

battery means mounted on the first arm of the bracket member;

alarm means mounted on the first arm of the bracket member;

thermometer means mounted on the second arm of the bracket member and having a column of mercury for indicating the temperature and a pair of spaced electrical contacts in the path of the column of mercury at an unsafe temperature; and

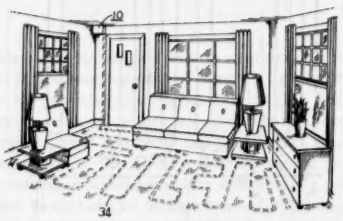
electrically conductive means connecting the battery means, the alarm means and the thermometer means in circuit whereby when the temperature in the freezer becomes unsafe, as indicated when the column of mercury reaches the electrical contacts, the circuit is closed and the battery means energizes the alarm means.

4,075,616

DETECTOR FOR ALARM SYSTEM

Joseph M. Rait, 1100 Amherst St., Buffalo, N.Y. 14216

Filed Nov. 12, 1975, Ser. No. 630,998
Int. Cl.[2] G08B *13/10*
U.S. Cl. 340—276 **4 Claims**



1. A switching device comprising an elongate flexible cable-like tubular carrier of insulating material of undefined length, sensing means occupying the full volume of said carrier and extending longitudinally substantially the entire length thereof, said sensing means comprising a fibrous, flexible, resilient mass of insulating material having a pair of uninsulated conducting wires spirally intertwined longitudinally therethrough in opposed spaced apart relationship, each point of one of said pair of conducting wire being disposed opposite a point on the other of said pair of conducting wires, the insulating material separating and insulating said conducting wires one from the other, said mass of insulating material being permeable to permit said conducting wires to penetrate said mass to thereby engage each other in response to an applied force transversely of the carrier in any direction and at any point, said mass being resilient for effecting restoration of said spaced relationship when the applied force is removed.

4,075,617

ALARM CIRCUIT FOR MONITORING REMOVAL OF PLUG FROM ELECTRICAL POWER RECEPTACLE

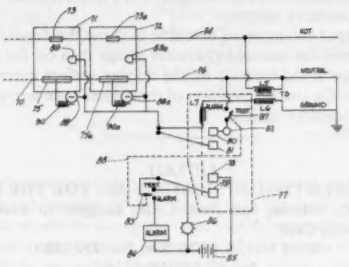
Wallace H. Wireman, 13 Park Ave., Walton, Ky. 41094

Filed May 17, 1976, Ser. No. 686,789
Int. Cl.[2] G08B *13/14*
U.S. Cl. 340—280 **12 Claims**

1. An alarm circuit for electrical devices of the type normally plugged into an electrical power receptacle to provide an alarm signal whenever an electrical plug having at least hot and neutral male contacts and associated with the electrical device has been removed from said receptacle, said alarm circuit comprising:

(a) an electrical power receptacle having hot, neutral and ground female contacts adapted to be connected respectively to hot, neutral and ground conductors of an alternating current supply system, said receptacle being adapted to receive therein said plug, said hot and neutral

male contacts adapted to make electrical connection respectively with said hot and neutral female contacts while said plug is inserted in said receptacle, said receptacle including switch means adapted to connect said ground conductor to said neutral conductor and being shiftable between a first switching condition for disabling said alarm circuit when said plug is inserted in said receptacle and a second switching condition for enabling said alarm circuit when said plug is removed from said receptacle,



said switch means being shiftable to said first switching condition by at least one of said male contacts when received in its respective female contact, said switch means being biased to return to said second switching condition when said at least one male contact is removed from its respective female contact; and

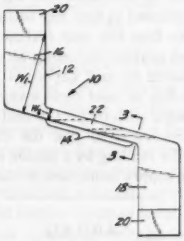
(b) an indicating circuit including a source of power operatively connected in series with said ground conductor and adapted to provide said alarm signal when said switch means is shifted to said second condition.

4,075,618

MAGNETIC ASYMMETRIC ANTIPILFERAGE MARKER

Samuel Montean, Blaine, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 15, 1976, Ser. No. 705,419
Int. Cl.[2] G08B *13/22*
U.S. Cl. 340—280 **15 Claims**



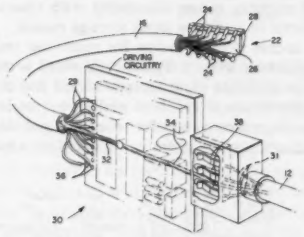
1. An antipilferage marker adapted for use in a system for sensing the presence of an object to which is affixed a said marker in an interrogation zone having therein a magnetic field periodically varying at a predetermined fundamental frequency, said marker comprising asymmetric sections of ferromagnetic material including a center section having end portions and having a permeability of not less than 10^4 and a coercive force of not more than 0.5 oersted, and two substantially planar flux concentrator sections having a permeability of not less than 10% of the permeability of the center section and a coercive force of not more than one oersted, one of which concentrator sections is secured to each end portion of the center section such that a low reluctance path exists therebetween, said concentrator sections having a predetermined area, the maximum dimension of which parallel to the width of the end portion of the center section to which it is secured is at least three times the width of said end portion such that magnetic lines of flux are collected and concentrated in the center section when a magnetic field periodically alternating at a predetermined frequency is impressed on the marker so as to provide an effective field impressed upon the center section of sufficient intensity to cyclically reverse the magnetization of the center section to result in the production of a detectable characteristic signal containing harmonics of the predetermined frequency in excess of the twentieth order.

4,075,619

REMOTE READING COMPASS DISPLAY

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Mar. 6, 1975, Ser. No. 556,081
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 R **3 Claims**



1. For use with a remote reading magnetic compass in which a digital output signal is provided representative of compass headings, circuitry for display of the present compass heading, comprising:

a first electrical cable having one end connected to a remote reading compass;

a second flexible electrical cable;

a multi-digit numerical indicator package of a size and configuration approximating that of said second cable and affixed to one end thereof, and including a single, dual-in-line package, integrated circuit, multi-digit display operative in response to said digital signals, and a housing enclosing said display and in sealing engagement with said second cable;

an interface circuit connected to the other end of said first cable and to the other end of said second cable and operative to receive the digital compass output signals from said remote reading compass and provide in response thereto second digital signals which are applied to the other end of said second cable for activating the multi-digit display so that the compass heading is displayed thereby; and

a fastener affixed to said indicator package and adapted for semipermanent attachment to a mounting surface, whereby the indicator package may be readily moved to various locations.

4,075,620

VIDEO DISPLAY SYSTEM

Francis C. Passavant, West Newton, and Richard R. Pease, Hingham, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 29, 1976, Ser. No. 681,505
Int. Cl.[2] G06K *15/20*
U.S. Cl. 340—324 AD **7 Claims**

1. Apparatus for displaying characters including in combination

display means capable of producing images on a display surface by selectively writing on the display surface while

repeatedly sweeping a raster scanline pattern over the display surface;

first memory means for storing digital code words in a plurality of storage positions, each storage position corresponding to a location on the display surface of said display means, and the storage positions being arranged in an array designating the locations on the display surface by first and second orthogonal sets of lines;

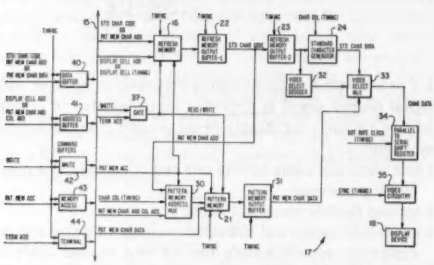
second memory means for storing character image data in a plurality of storage positions;

each of said digital code words being a character code word representing a character to be displayed or being an address code word designating storage positions in said second memory means;

data input storage means for receiving and storing a digital code word, or character image data;

address input storage means for receiving and storing display location information designating a storage position in said first memory means associated with a digital code word stored in said data input storage means, or storage position information designating storage positions in said second memory means associated with character image data stored in said data input storage means;

memory access storage means for receiving and storing a first indication when a digital code word is received and stored in said data input storage means and display location information is received and stored in said address input storage means, and for receiving and storing a second indication when character image data is received and



stored in said data input storage means and storage position is received and stored in said address input storage means;

said first memory means being operable to receive a digital code word from said data input storage means and the associated display location information from said address input storage means and to store the received digital code word in the storage position designated by the received display location information when enabled by a first indication from said memory access storage means;

said second memory means being operable to receive character image data from said data input storage means and the associated storage position information from said address input storage means and to store the received character image data in the storage positions designated by the storage position information when enabled by a second indication from said memory access storage means;

first memory readout means for reading out digital code words from the storage positions of said first memory means designating locations in a line of the first orthogonal set in sequence for each tracing of a scanline;

second memory readout means coupled to said first memory means for reading out character image data from the storage positions in said second memory means designated by an address code word read out of said first memory means;

character data generating means coupled to said first memory means and operable in response to a character code word being read out of a storage position in the first memory means to generate character image data pertaining to the character represented by the character code word; and

output means coupled to the character data generating means, the second memory means, and the display means;

said output means including character data selection means for selecting character image data from the character data generating means in response to a character code word being read out of said first memory means and for selecting character image data from the second memory means in response to an address code word being read out of said first memory means;

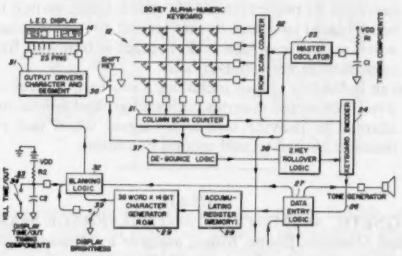
said output means being operable to cause the display means to write the selected character image data on the display surface at the location on the display surface corresponding to the storage position of the digital code word in said first memory means.

4,075,621

HAND HELD COMMUNICATION AID FOR THE DUMB

D'Miles E. Salmon, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Nov. 5, 1976, Ser. No. 739,149
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—337 **9 Claims**



1. A communication aid for the dumb comprising: a case having an elongated portion and an enlarged portion said portions constituting a substantially co-planar top surface of said case said elongated portion being configured so that it may be securely grasped by one hand and with an input alpha-numeric keyboard included in said top surface of said elongated portion oriented to face the user for operation by the other hand, said enlarged portion including an alpha-numeric visual display panel actuated by said keyboard located at an end of said enlarged portion of said case away from the user and oriented at a 90° angle with respect to said top surface in which said keyboard is included so that the display is visible and properly oriented for reading by a person standing opposite the user; and a power supply contained within said case.

4,075,622

VARIABLE-TO-BLOCK-WITH-PREFIX SOURCE CODING TECHNIQUE

John C. Lawrence, Encinitas, and Albert Roth, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1975, Ser. No. 546,051
Int. Cl.[2] H03K *13/24*
U.S. Cl. 340—347 DD **15 Claims**

1. A data compression encoder for compressing a variable length N_i stream of data bits into a block of N_o encoded bits including a group of S bits indicative of the rank of said sequence comprising:

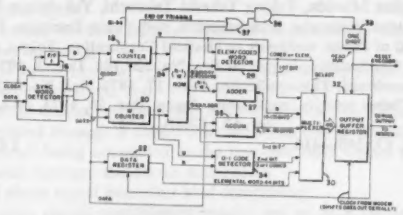
a first means for providing a predetermined set of the elements of Pascal's triangle such that $2^S - 1$ is the largest member of said set provided;

second means for initiating a random walk in said predeter-

mined set of the elements in Pascal's triangle in response to receipt of said stream of data bits;

third means connected to said first means for accumulating the sums of the W^{th} elements in the $(n-1)^{st}$ rows of Pascal's triangle in response to receipt of each binary "1" data bit from said stream of data bits where w is the current number of data stream "1"'s received and n is the current member of data stream data bits received; and

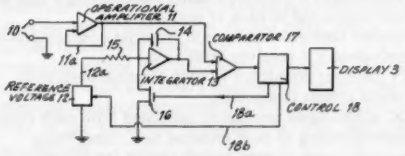
output means for accepting from said third means a group of S bits representative of the rank of said stream of data bits and for accepting from said second means a group of P bits representative of the length of said stream of data bits.



4,075,623
REFERENCE VOLTAGE CIRCUIT

Yoshikiyo Futagawa; Kanemitsu Kubota, and Hiroshi Kamakura, all of Shiojiri, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo and Shinshu Seiki Kabushiki Kaisha, both of, Japan

Filed June 28, 1976, Ser. No. 700,264
Claims priority, application Japan, June 26, 1975, 50-79770
Int. Cl.[2] H03K 13/02; G05F 3/14
U.S. Cl. 340—347 NT **21 Claims**

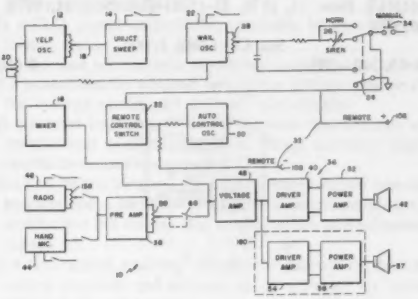


12. In an analog-to-digital converter circuit including reference voltage circuit means for producing a fixed reference voltage, integrator circuit means for integrating said fixed reference voltage, comparator means for comparing the voltage level of said integrated fixed reference voltage with a further voltage level, and control means coupled to the comparator means for producing a digital count representative of the magnitude of said further voltage level, the improvement comprising said fixed reference voltage circuit including a fixed voltage means adapted to be referenced to a fixed voltage in response to a referencing voltage being applied thereto, charge storage means coupled to said integrator circuit means and adapted to be charged to a reference voltage, a current gating means coupled in series with said charge storage means, said series-coupled current gating means and said charge storage means being coupled in parallel with said fixed voltage means, and supply means coupled to said control means for supplying a referencing voltage, a first transistor switching means disposed intermediate said supply means and said fixed voltage means for intermittently applying said referencing voltage to said charge storage means and said fixed voltage means for a sufficient interval of time to charge said storage means to a reference voltage when said fixed reference voltage is to be integrated by said integrator means.

4,075,624
ELECTRONIC SIREN STRUCTURE AND METHOD

Richard M. Sheff, 6564 E. Michigan Ave., Saline, Mich. 48176

Filed May 15, 1974, Ser. No. 469,945
Int. Cl.[2] G08B 3/00
U.S. Cl. 340—384 E **11 Claims**

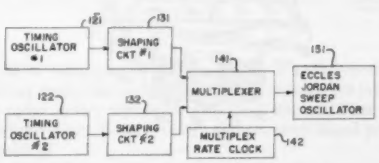


1. Electronic siren structure comprising a varying pitch yelp oscillator, means for driving the yelp oscillator to produce a square wave output therefrom, a varying pitch wail oscillator, means for driving the wail oscillator to produce a square wave output therefrom, mixer circuitry electrically connected to the yelp and wail oscillators for receiving and mixing square wave signals from the yelp and wail oscillators and providing a mixer output signal in accordance therewith, switch means connected to the yelp and wail oscillators and the mixer for switching the output signal from the mixer to one of the yelp oscillator signal separately, the signal from the wail oscillator separately, and the signal from the yelp and wail oscillators simultaneously, and output structure electrically connected to the yelp and wail oscillators for receiving the output signal from the mixer, and providing a signal output for warning of the approach of an emergency vehicle carrying the electronic siren structure.

4,075,625
AUDIBLE ELECTRONIC WARNING SYSTEM

Richard F. Cieslak, Algonquin, and John V. Balding, Palatine, both of Ill., assignors to Industrial Electronics Service Co., Schaumburg, Ill.

Continuation-in-part of Ser. No. 550,219, Feb. 18, 1975, which is a continuation-in-part of Ser. No. 377,644, July 9, 1973, Pat. No. 3,889,256. This application Mar. 8, 1976, Ser. No. 664,434
Int. Cl.[2] G08B 3/00
U.S. Cl. 340—384 E **11 Claims**

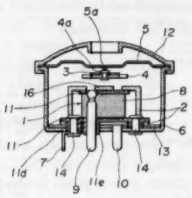


1. An electronic siren system including a first timing oscillator and a second timing oscillator, each of said oscillators having an associated shaping network, a mixing means common to both said oscillators and their respectively associated shaping networks, both of said timing oscillators and associated shaping networks directing their respective outputs to said mixing means, and a sweep oscillator, said mixing means fed by both said oscillators and associated networks creating a complex signal input to said sweep oscillator.

4,075,626
ALARM BUZZER

Mitsuo Sakaguchi; Hikoji Iwasaki, and Shigeo Shimoya, all of Tokyo, Japan, assignors to Kobishi Electric Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1977, Ser. No. 765,466
Claims priority, application Japan, Nov. 11, 1976, 51-151613[U]; Nov. 11, 1976, 51-151614[U]; Nov. 11, 1976, 51-151615[U]
Int. Cl.² G10K *1/00*
U.S. Cl. 340—388 9 Claims

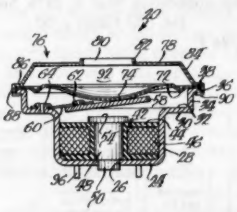


1. An alarm buzzer comprising an electromagnet, a yoke on which said electromagnet is mounted while maintaining insulation from a housing, an armature which is held with a plate spring on said yoke and is attracted by said electromagnet, a vibratory plate which contacts said armature, and a housing which incorporates the above components wherein a bobbin of said electromagnet is made of an insulating material and consists of a hollow cylinder which receives an iron core in it and is wrapped with coil on its outer periphery, first flange provided on one end of said hollow cylinder, second flange provided on the other end of the hollow cylinder and at least one hollow projection provided on said second flange in a direction parting from said first flange, said yoke is provided with at least one hole into which said hollow projections of the bobbin is inserted, and the bobbin and the yoke are fixed to the housing of the alarm buzzer by a fixture which is inserted into the hollow projection of the bobbin inserted into said hole of the yoke.

4,075,627
ELECTRIC HORN

George R. Pariza, Schaumburg, Ill., assignor to Pittway Corporation, Northbrook, Ill.

Filed Feb. 2, 1977, Ser. No. 765,049
Int. Cl.² G08B *3/10*
U.S. Cl. 340—388 11 Claims

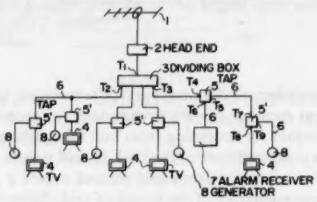


1. An improved horn for generating an audible signal, comprising a housing formed of magnetically permeable material having walls the margins of which define an opening; an electromagnetic coil closely confined within said housing; a diaphragm of relatively flexible material positioned on said housing over said opening and closing said housing; and a striker member of magnetically permeable material mounted in said housing between said diaphragm and said coil and operatively associated with said coil for movement away from and strikingly against said diaphragm to generate noise, said housing itself constituting the magnetic flux path for said coil and striker.

4,075,628
ALARM SYSTEM UTILIZING CABLE-TV MULTI-RECEIVER SYSTEMS

Hajime Masuda, Tokyo; Takeshi Takeuchi, Yokohama; Masakatsu Watanabe, Akatsukashin, and Yukio Tomioka, Tokyo, all of Japan, assignors to Hochiki Corporation, Tokyo, Japan

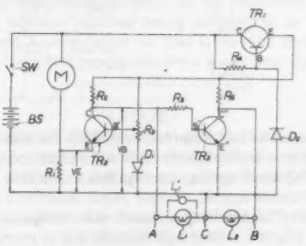
Continuation-in-part of Ser. No. 529,148, Dec. 3, 1974, abandoned. This application Nov. 17, 1976, Ser. No. 742,731
Claims priority, application Japan, Dec. 29, 1973, 49-4131
Int. Cl.² G08B *25/00*
U.S. Cl. 340—416 2 Claims



1. An alarm system combined with a cable TV system for a plurality of domiciles, comprising:
- a common antenna for receiving broadcast television carrier signals,
- a coaxial lead-in cable connected to said antenna,
- a head terminal connected to said lead-in cable having a circuit for amplifying such signals,
- an amplified-signal coaxial cable connected to said head terminal,
- a dividing manifold box connected to said amplified-signal cable having a plurality of output signal terminals,
- an individual-TV receiver coaxial cable having a core and a tube connected to each of said terminals,
- a separate terminal unit in each domicile connected to each individual-TV receiver cable, and
- a TV receiver connected to each terminal unit; with
- an alarm system comprising
- a DC alarm signal generator associated with each domicile corresponding to each terminal unit, comprising:
- a normally open trigger switch-circuit for effectively connecting between the core and tube of a coaxial cable in each terminal unit in each domicile, a resistance of a preselected individual value corresponding to each domicile under protection of the alarm system, in response to need for generating an alarm; and
- a common alarm receiver located at a convenient station adjacent a terminal unit in one of said domiciles comprising:
- a DC alarm signal receiving circuit connected across the core and tube of a coxial cable in the terminal unit adjacent thereto, provided with means for indicating the particular domicile in which an alarm signal is generated by the corresponding alarm signal generator, when the latter switches the corresponding resistance in the core-tube circuit in response to a source of alarm in such domicile,
- said driving manifold box comprising:
- a main TV signal dividing unit circuit in which the number of TV output signal terminals is increased by split choke coil circuits to correspond with the number of domiciles, and
- an auxiliary circuit including DC blocking capacitors for preventing an alarm signal flowing into said main TV signal dividing circuit,
- said auxiliary circuit also including low-pass filters comprising choke coils constituting a DC passing circuit for an alarm signal, without interference between the DC alarm and TV signals,

each terminal unit comprising:
input and output terminals for TV and DC alarm signals,
parallel circuits connecting said input and output terminals
one of said parallel circuits containing a capacitor for blocking a DC alarm signal and passing the TV signal, and
the other parallel circuit containing a low-pass filter comprising choke coils and a capacitor, for conducting an alarm signal,
one of said terminal units adjacent the alarm receiver station also including:
alarm signal receiver terminal in addition to said input and output terminals, and
a circuit connecting the tube of the corresponding cable to ground through a choke coil, the other end of the latter circuit being connected to the low-pass filter circuit at a point between the choke coils threof,
said alarm signal generator also comprising:
a trigger circuit containing a resistor and an SCR thyristor connected to the core and tube respectively of the cable terminal unit associated threwith, and
a firing circuit therefor comprising a normally open switch for energizing said thyristor and inserting said resistor in the core-tube circuit of the cable when said switch is closed,
said alarm receiver also comprising:
a + line connected to a source of power and to the coaxial cable core,
a − line connected to said power source and to the coaxiable cable tube,
a first rotary switch having fixed contacts of resistence which correspond in value to that of the resistances peculiar to the several alarm signal generators,
a second rotary switch interlocked with said first rotary switch having fixed contacts,
a pilot lamp connected to each of said latter contacts and said + line, for indicating the domicile from which an alarm signal is generated.
a circuit connected across said + and − lines, containing in series a first relay for driving said rotary switches, an interrupting switch adapted to open and close upon energization and deenergization of said relay, and a contact switch of a second relay, and
a switching circuit automatically operable in conjunction with said relays and rotary switches for moving the latter stepwise to match the contact of a lamp corresponding to that of the particular domicile source of alarm signal generations.

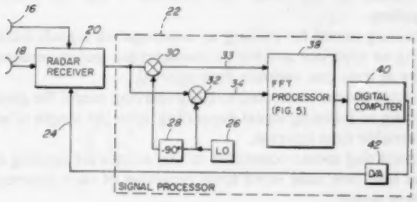
4,075,629
WARNING DEVICE
Toshiaki Miyamae, 9-15, Nishi-1 chome, Nakagawa, Ikuno, Osaka, Japan
Filed Dec. 23, 1976, Ser. No. 753,906
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—421 **3 Claims**



1. An electronic warning device for a motorized fishing reel, comprising

(a) an electric circuit means including a carbon film resistor, a first transistor and a voltage stabilizing diode;
(b) a switch means mounted in a reel body in externally operable relation, being connectable to an independent electric source;
(c) an emitter of said first transistor adapted to normally emit a pre-determined voltage irrespective of the voltage emitted by said source;
(d) a D.C. motor controllably rotatable by operating said switch means;
(e) a nicrome wire resistor connected to said motor in series;
(f) a potentiometer adapted to select a voltage greater than the voltage across said nicrome wire resistor;
(g) a second transistor disposed between said nicrome wire resistor and said potentiometer, being normally kept in conductive condition;
(h) a first output terminal connected to said second transistor and adapted not to emit voltage when said transitor is kept conductive but to emit said voltage when said transistor is turned off;
(i) a first signal emitting element connected to said first output terminal and adapted to be actuated by voltage supplied by said terminal;
(j) a third transistor that normally remains non-conductive when not being supplied with said voltage from said second transistor but which is turned on when supplied with said voltage from said second transistor through said carbon file resistor;
(k) a second output terminal connected to said third transistor and adapted to be normally supplied with said voltage; and
(l) a second signal emitting element connected to said second output terminal and adapted to be actuated by said voltage from said second output terminal.

4,075,630
SIGNAL PROCESSOR
Gerald N. Shapiro, Newton Center; Bertram J. Goldstone, Lexington; Joseph D. Simone, Chelmsford, and Edward E. Spignese, Marblehead, all of Mass., assignors to Raytheon Company, Lexington, Mass.
Filed Sept. 1, 1976, Ser. No. 721,629
Int. Cl.[2] G01S *9/02*
U.S. Cl. 343—5 DP **2 Claims**



1. In a radar-guided missile having a radar receiver for receiving radar return signals, a signal processor for processing such radar return signals to provide a discrete Fast Fourier Transform on such radar return signals, such signal processor comprising:
(a) means for separating such radar return signals into two quadrature components;
(b) means for converting each sample of such components into a corresponding digital word;
(c) means for converting each digital word into a sequence of binary digits;
(d) clock means for producing a sequence of binary control signals;
(e) scaling means, responsive to a portion of the sequence of binary control signals, for scaling each digital word by a factor selected in accordance with the binary control

signals to form a sequence of binary digits corresponding to such scaled digital word;

(f) memory means for storing and serially retrieving such latter sequence of binary digits;

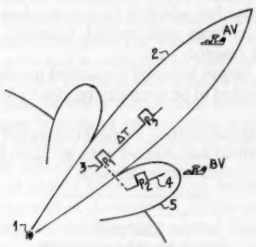
(g) data decoder means, responsive to at least a portion of the sequence of binary control signals, the serially retrieved sequence of binary digits and a second sequence of binary digits corresponding to a different one of the digital words, for producing a sequence of binary digits corresponding to an arithmetic operation of the digital words in the two sequences of binary digits responded to by the data decoder means.

4,075,631

SYSTEM FOR IDENTIFYING OBJECTS EQUIPPED WITH AN AUTOMATIC TRANSPONDER

Bernard Dumez, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 17, 1975, Ser. No. 641,620
Claims priority, application France, Dec. 18, 1974, 74 41801
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—6.5 R **9 Claims**



1. In a system for identifying, with the aid of interrogation signals radiated from a fixed station in a directional pattern, moving objects equipped with an automatic transponder generating response signals upon receiving said interrogation signals,

the improvement wherein said transponder comprises:

a source of code words each consisting of a predetermined number of significant bits between a pair of framing pulses;

receiving means for picking up interrogation signals including an invariant number of characteristic pulses separated by at least one variable time interval;

detector means connected to said receiving means for generating an indexing signal depending upon the length of said variable time interval;

transmitting means connected to said source for sending out at least one code word upon reception of each interrogation signal;

programmable scrambling means inserted between said source and said transmitting means for interchanging the bits of an outgoing code word;

random-access memory means containing a multiplicity of stored programs for the selective control of said scrambling means, the latter including a multiplexer with parallel signal inputs connected to said source for receiving said significant bits, address inputs connected to said memory means and an output connected to said transmitting means, said source including a mode selector with a multiplicity of output terminals respectively connected to said signal inputs;

addressing means connected between said detector means and said memory means for selecting at least one of said stored programs upon reception of each interrogation signal in response to said indexing signal; and

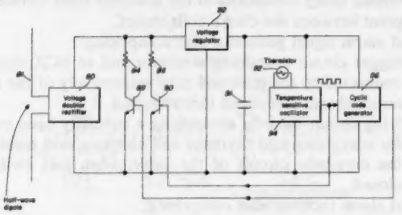
clock-controlled sequencing means connected to said addressing means for stepping same through the selected program.

4,075,632

INTERROGATION, AND DETECTION SYSTEM

Howard A. Baldwin; Steven W. Depp; Alfred R. Koelle, and Robert W. Freyman, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 501,020, Aug. 27, 1974, abandoned.
This application May 24, 1976, Ser. No. 689,708
Int. Cl.[2] G01S 9/56; H04B 1/59
U.S. Cl. 343—6.8 R **10 Claims**



1. In telemetry apparatus, a passive transponder comprising:

an antenna;

rectifier means having a first pair of terminals connected to said antenna and having a second pair of terminals providing direct current;

variable loading means connected to said second pair of terminals; and

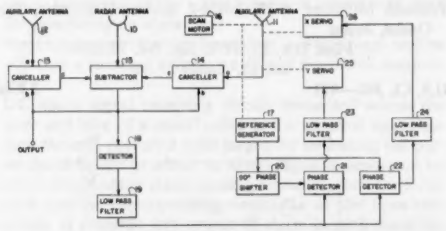
information encoding means in circuit with said variable loading means to enable encoded information to vary the direct current drawn from said rectifier by said variable loading means, thereby varying the impedance of said rectifier means at said first pair of terminals, and varying the reflectivity of said antenna.

4,075,633

SPACE ADAPTIVE COHERENT SIDELOBE CANCELLER

Bernard L. Lewis, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 25, 1974, Ser. No. 519,469
Int. Cl.[2] G01S 3/06
U.S. Cl. 343—100 LE **7 Claims**



1. An interference suppression system for cancelling interference from a multiple source environment comprising:

a main channel sensor constructed to receive desired and interference signals;

a plurality of auxiliary channel sensors spaced about said main channel sensor and constructed to receive primarily interference signals;

canceller means coupled to said main and auxiliary channel sensors for cancelling interference from said main channel signals and providing a main channel output; and

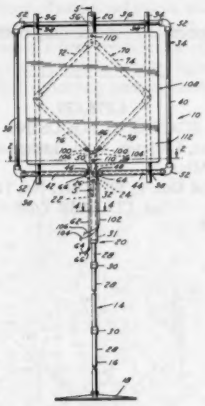
positioning means coupled to at least one of said auxiliary channel sensors and responsive to said main channel output for positioning said at least one auxiliary channel sensor relative to said main channel sensor such as to provide improved interference cancellation in said main channel output.

4,075,634

PORTABLE ANTENNA ASSEMBLY FOR TELEVISION RECEIVER

Edward Gutha, 13930 Mapleridge, Detroit, Mich. 48205

Filed Jan. 10, 1977, Ser. No. 757,814
Int. Cl.[2] H01Q 7/00
U.S. Cl. 343—742 **10 Claims**



1. A portable antenna assembly for use with a television receiver and for receiving very high and ultra-high frequency television signal carrier waves radiated from transmitters located at varying distances and in different directions from the antenna assembly comprising a stand having a vertically extending stationary base member and a vertically extending antenna support member which is carried by and rotatably mounted on said base member about a vertical axis, a first tubular antenna of generally rectangular configuration secured to said support member and located in a vertical plane, a second tubular antenna of generally rectangular configuration secured to said support member and located in a vertical plane, each of said first and second antennas having a gap between a pair of closely adjacent but spaced apart end portions thereof, a first cable consisting of two wires, each wire of said first cable being secured on one end thereof to an end portion of said first antenna and adapted to be secured on the other end to the very high frequency terminal of the television receiver, and a second cable consisting of two wires, each wire of said second cable being secured on one end to an end portion of said second antenna and adapted to be secured on the other end to the ultra-high frequency terminal of the television receiver, said antenna support member being adapted to be manually rotated on said base member so that it may be directed and positioned to best receive signals from a selected transmitter.

4,075,635

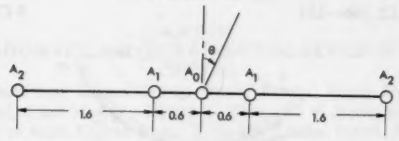
NONUNIFORMLY OPTIMALLY SPACED ARRAY WITH SPECIFIED ZEROS IN THE RADIATION PATTERN

Hillel Unz, c/o Electrical Engineering Department, University of Kansas, Lawrence, Kans. 66045

Filed Feb. 23, 1976, Ser. No. 660,627
Int. Cl.[2] H01Q 21/08
U.S. Cl. 343—844 **10 Claims**

1. A method of synthesis for controlling the radiation pattern of a general

linear nonuniformly spaced array with nonuniform amplitudes by specifying the zeros (nulls) of the radiation pattern explicitly, said method based on the following rigorous relationship which expresses the array radiation pattern (Fu) of an array of N elements by a determinant of N rows and N columns, with the first row consisting of N terms $\exp(ix_p u)$, and each subsequent row consisting of N terms $\exp(ix_p u_r)$, u_r being identical in the terms of each row and represents explicitly the zero (null) of the array radiation pattern $F(u)$, the total number of zeros (nulls) so specified equal to (N-1), with N being the number of the elements of the array, where



$u = \pi \sin \theta$

θ being the angle with the normal to the array axis,

x_p is the distance of the p-th array element from the reference origin in terms of half wavelength ($\lambda/2$),

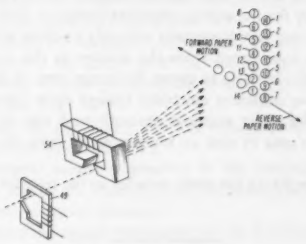
A_p is the amplitude of each corresponding element of the array to be found by developing the above mentioned determinant along its first row and identifying the amplitude of each element at position x_p as the factor multiplying the corresponding term $\exp(ix_p u)$.

4,075,636

BI-DIRECTIONAL DOT MATRIX PRINTER WITH SLANT CONTROL

Louis Valentine Galetto, Apalachin; Johann Hans Meier; Walter Thornton Pimbley, both of Vestal, and Bruce Allen Wolfe, Johnson City, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,235
Int. Cl.[2] G01D 15/18
U.S. Cl. 346—75 **14 Claims**



13. A dot matrix printer apparatus capable of bi-directionally printing successive lines of characters using relative motion between a print medium and a print means,

said print means comprising means for sequentially recording a line of dots orthogonal to the direction of said bi-directional motion,

means for controlling the operation of said print means for recording characters in the form of a plurality of said lines of dots during said bi-directional relative motion including

slant correction means for correcting for slanting of said lines of dots due to said relative motion in both directions including,

direction determining means for indicating the direction of said relative motion during said recording of said lines of dots, and

means responsive to direction indications from said direction

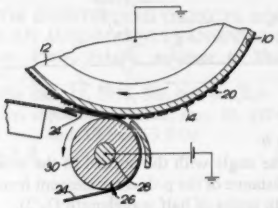
determining means for reversing the sequence for recording dots to form lines of dots in correspondence with reversals in the direction of said relative motion.

4,075,637

ELECTROSTATIC MULTI-COPIER

Joseph Gilbert, Ilford; Malcolm McKenzie McRobbie, Brentwood, and Wilfred Gee, New Barnet, all of England, assignors to Ozalid Group Holdings Limited, Loughton, England

Filed June 16, 1976, Ser. No. 696,805
Int. Cl.² G03G *15/09*
U.S. Cl. 346—153 **8 Claims**



1. An electrostatic duplicator, comprising:

a rotatable cylinder for supporting a master constituted by a sheet of material bearing an image to be duplicated, the image area of the master having an electrical resistivity which is substantially greater than that of the background area;

means for rotating the cylinder;

an applicator for applying toner powder only to the image area of the master on the cylinder subsequent to charging of the master by means of a charge transfer roller;

means for feeding transfer sheet material repeatedly into a nip between the cylinder and a charge transfer roller, to which nip the master is advanced from the applicator by rotation of the cylinder;

a source of electrical potential connected to the charge transfer roller, said charge transfer roller being the sole agency for imparting electrical charge to said master and operating simultaneously not only to cause toner powder to be transferred from the master to the transfer sheet material but also to cause the image area of the master to receive sufficient electrical charge upon passage of said transfer sheet material through said nip to enable the image area to pick up toner powder from the applicator; and

a unit for fixing the toner powder to the transfer sheet material.

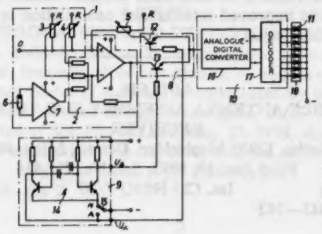
4,075,638

CAMERA WITH AUTOMATIC EXPOSURE FACTOR MECHANISM

Karl-Peter Strauss, Volkmarode, and Dietmar Elke, Braunschweig, both of Germany, assignors to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Dec. 17, 1976, Ser. No. 751,868
Claims priority, application Germany, Dec. 20, 1975, 2557682
Int. Cl.² G03B *17/20*
U.S. Cl. 354—23 D **13 Claims**

1. A camera in which an exposure factor is determined automatically in accordance with prevailing illumination conditions and which may be selectively operated either in automatic mode with said factor set in accordance with its automatic determination or in manual mode with said factor set manually, said camera comprising indicating means for indicating both the automatically determined exposure factor and the manually set exposure factor when the camera is operated in manual mode, said indicating means including a plurality of



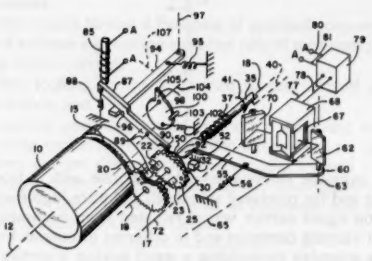
light sources respectively representing different values of said factor.

4,075,639

DUAL SCANNING FOCUSING SYSTEM

Dean M. Peterson, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 1, 1976, Ser. No. 728,565
Int. Cl.² G03B *7/08*
U.S. Cl. 354—25 **13 Claims**



1. Apparatus for use with a system which includes scanning means to receive and transmit radiation from a scene containing an object, radiation responsive means to receive radiation from the scanning means and to produce an output signal indicative of the distance to the object and a member to be positioned in accordance with the output signal comprising:

drive means movable through a range of positions;

movable means connecting said drive means to said scanning means, said drive means operable to cause said scanning means to provide first and second scans of the scene during one movement of the drive means through the range;

Positioning means connecting said drive means to the member, said drive means operable to move the member; and

signal responsive means connected to the radiation responsive means to receive the output signal and operable in accordance therewith to stop the movement of the member only during the second scan provided by the scanning means.

4,075,640

CAMERA WITH EXPOSURE CONTROL MECHANISM

Hiroshi Ueda, Nara, and Akira Yoshizaki, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sept. 22, 1976, Ser. No. 725,470
Claims priority, application Japan, Sept. 29, 1975, 50115,486
Int. Cl.² G03B *7/08*
U.S. Cl. 354—31 **29 Claims**

1. A camera comprising:

an objective lens;

a diaphragm;

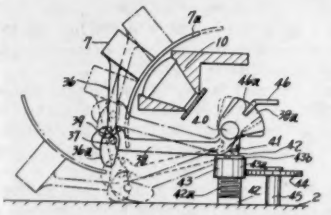
a camera body in which a film is located at the focal plane of said objective lens;

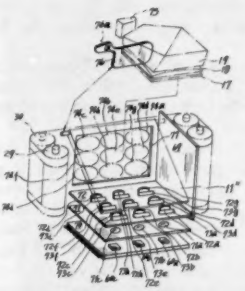
light responsive means arranged within said camera body for receiving scene light passing through said objective lens and providing an output signal in response to such light;

means for indicating an exposure value in accordance with an output of said light responsive means;

first reflecting means disposed between said focal plane and said objective lens, said first reflecting means being half transparent and being movable between a first position for causing scene light having passed through said objective lens and said diaphragm to be partially reflected away from said focal plane and partially passed through towards said focal plane and a second position for permitting all of such scene light to pass towards said focal plane;

second reflecting means disposed behind said first reflecting means and in front of said focal plane, said second reflecting means being movable together with said first reflecting means between a first position for reflecting towards said light responsive means scene light having passed through said first reflecting means when in its first position and a second position when said first reflecting means is in its second position for permitting such scene light to pass towards said focal plane;





light restricting means disposed in front of said light responsive means for restricting scene light incident on said light responsive means, said light restricting means including a central aperture and being movable with said aperture being in alignment with said light responsive means and said second reflecting means when in its first position; and,

manual switch means for moving said light restricting means relative to said light responsive means.

16. A camera including an objective lens, a diaphragm, a camera body in which a film is located at the focal plane of the objective lens, a focal plane shutter having a leading member and a trailing member which control the light reaching an image plane of the film to be exposed, the reflectance of the leading member being substantially equal to that of the surface of the film, means for driving the leading member to initiate an exposure of the film, and an exposure control mechanism, said exposure control mechanism comprising:

light measuring means including a plurality of photosensitive means disposed in said camera body to respectively receive scene light passing through said objective lens and said diaphragm and reflected from different portions of the entire area of the surface of said leading member and exposed portions of said film;

operable means for selectively activating said photosensitive means of said light measuring means, said light measuring means generating an output commensurate with the average value of the outputs of said activated photosensitive means; and,

means for controlling an exposure in dependence upon the output of said light measuring means.

4,075,641

AUTOMATIC EXPOSURE CONTROL DEVICE IN A CAMERA

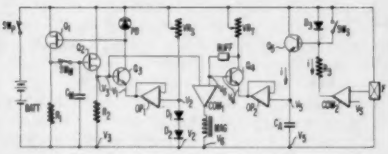
Naoyuki Uno, Urawa; Tetsuji Shono, Ranzan; Fumio Urano, Omiya, and Masahiro Kawasaki, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1975, Ser. No. 625,613

Claims priority, application Japan, Oct. 29, 1974, 49-124563

Int. Cl.[2] G03B 7/08

U.S. Cl. 354—43 **11 Claims**



1. An iris adjustment control for cameras which, using the APEX operational equations, compares the brightness value B_V and film sensitivity value S_V with the iris size indication value A_V and shutter speed value T_V and automatically adjusts the iris when the shutter release is actuated, said iris adjustment control comprising:

first means for generating a first voltage proportional to said brightness value B_V,

second means for generating a second voltage proportional to said film sensitivity value S_V,

memory means connected to said first and second means and responsive to the actuation of the shutter release for storing a third voltage proportional to said first and second voltages,

third means for generating a fourth voltage proportional to said shutter speed value T_V,

iris movement means responsive to the actuation of the shutter release for changing the iris setting at a constant rate from an initial position,

pulse generating means responsive to the movement of the iris for genertng electric pulses having a constant width, the cumulative number of pulses generated being directly proportional to the iris size indication value A_V at any point in time during the movement of the iris,

integrating means receiving said electric pulses and generating a fifth voltage proportional to said iris size indication value A_V,

summing means connected to said third means and said integrating means for genertng a sixth voltage proportional to the sum of said fourth and fifth voltages,

comparing means connected to said memory means and said summing means for generating an output when said third and sixth voltages are equal satisfying the APEX equation

$$B_V + S_V = A_V + T_V$$

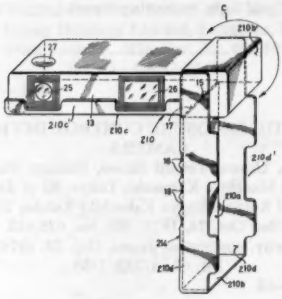
and fifth means responsive to the output of said comparing means to stop further movement of the iris.

4,075,642

PHOTOGRAPHIC IMPLEMENT

Fritz Niggeloh, Fichtenhof, (5608) Radevormwald, Germany

Filed Aug. 8, 1975, Ser. No. 603,199
Claims priority, application Germany, Aug. 8, 1974, 2438110; Nov. 2, 1974, 2452043
Int. Cl.[2] G03B *17/00*
U.S. Cl. 354—82 13 Claims



1. A photographic implement comprising:

a pocket camera having a flat, generally prismatic body with side faces provided with a photographic objective and a viewfinder alongside each other;

a protective case having a pair of cheek plates parallel to said side faces having formed thereon a pair of guide tracks, said body being provided on an end thereof with pivot studs transverse to said side faces engaging in said tracks for facilitating relative displacement of said body and said case in a composite motion with endwise insertion of said body into said case to establish a nonoperating position, said cheek plates bracketing said body and obstructing said objective and said viewfinder by respectively overlying said side faces in said nonoperating position; and

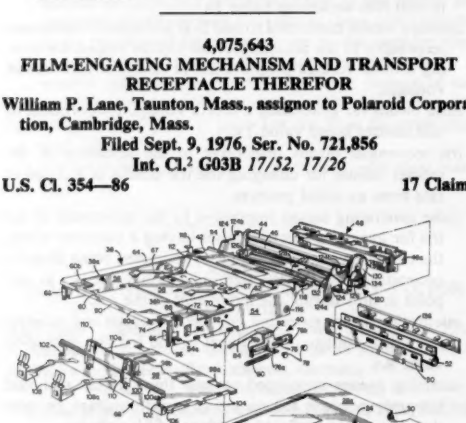
holding means on said case engageable with said body for arresting said case in an operating position with said cheek plates extending substantially perpendicularly to said body whereby said case is usable as a rigid handgrip for said camera.

4,075,643

FILM-ENGAGING MECHANISM AND TRANSPORT RECEPTACLE THEREFOR

William P. Lane, Taunton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 9, 1976, Ser. No. 721,856
Int. Cl.[2] G03B *17/52, 17/26*
U.S. Cl. 354—86 17 Claims



1. In apparatus for engaging self-developing photographic film, in the form of cassette-housed separate card-like film units, in a camera; said apparatus receiving and positioning a replaceable film cassette with the foremost film unit therein located for photographic exposure, advancing the foremost film unit from the cassette, and processing the advanced film unit with fluidic photoprocessing composition which it carries, said apparatus having

(i) a transparent receptacle for replaceably receiving a cassette having a casing containing such card-like self-developing film units stacked under an exposure window thereof, said casing further having an exit slot and having an access opening through which the foremost film unit is accessible for dislodgment from the cassette through the exit slot, said receptacle having a front end and a back end, and

(ii) a spread-roll processor for such self-developing film units, said processor being hingedly mounted to the receptacle for movement between a first position where it is aligned at the front of the receptacle with a film unit being advanced out of a cassette received in the receptacle, and a second position where the processor is removed from the front of the receptacle clear of the path of a cassette being loaded into and being removed from the receptacle, said apparatus comprising the improvement wherein

A. a single metal sheet of substantially uniform thickness forms a top wall, a bottom wall, and first and second side walls of said receptacle to define an open-fronted cassette compartment therein,

(1) said top wall having an aperture located above the exposure window of a cassette seated in said receptacle compartment and having first and second side members and back and front members around the periphery of said aperture,

(2) said front member of said top wall having to metal sheet configured to form deflection-resistant rib means along the span thereof at least between said side members,

(3) said metal sheet additionally forming a set of positioning tab members projecting across the back of said compartment,

(4) said compartment-forming walls and said tab member engaging a cassette inserted into said compartment for positioning the cassette relative to the receptacle along three different sides,

B. a pick mechanism mounted on said metal sheet for film-advancing movement relative thereto, and projecting a pick arm into said compartment from an actuator-engaging element thereof located outside said compartment, and

C. means carried on said metal sheet for pivotally mounting said processor to said receptacle and for fixing the pivotal orientation of said processor relative to said compartment when in said first position thereof and for releasably latching said processor in said first position.

4,075,644

MOTOR DRIVE MEANS FOR MOTOR DRIVEN SINGLE LENS REFLEX CAMERA

Tsutomu Hosono, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Sept. 8, 1976, Ser. No. 721,233
Claims priority, application Japan, Sept. 12, 1975, 50-110626
Int. Cl.[2] G03B *1/18*
U.S. Cl. 354—173 5 Claims

1. A device for operating a film wind-up motor in a motor driven camera provided with a motor for winding up a film having one perforation per frame comprising in combination:

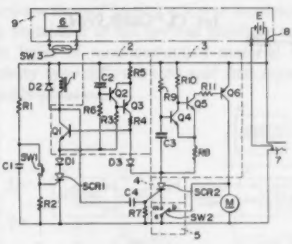
a mirror operating solenoid provided in the camera for swinging up a mirror in a camera body upon receipt of an electric current,

a time constant circuit connected with said mirror operating solenoid for supplying an electric current thereto upon release of a shutter in the camera and stopping the supply of current when a time determined thereby has lapsed,

a switch means connected with a film wind-up motor in the camera for starting supply of current to the motor upon

turning off of the solenoid or upon supply of electric power to said switch means, and

a film perforation detecting means provided in the camera for detecting perforations in the film loaded in the camera as the film is fed in the camera and turning off said switch means upon detection of a perforation in the film,



whereby the motor is driven when the solenoid is turned off or the switch means is supplied with electric power, and the motor is stopped when the film perforation detecting means detects a perforation in the film.

4,075,645

FOLDING CAMERA

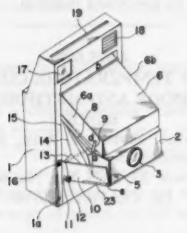
Tsuneaki Munakata, Tokyo, and Makoto Kuboshima, Sagamihara, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 27, 1976, Ser. No. 754,806

Claims priority, application Japan, Dec. 27, 1975, 51-157227

Int. Cl.[2] G03B *17/04*

U.S. Cl. 354—187 **4 Claims**



1. Folding camera comprising at least

an exposure compartment comprising opaque wall portions and defining an exposure station whereat film material may be exposed;

a lens mount carrying at least a taking lens means able to focus image-wise light reflected from an external scene to be photographed onto said film material, and having a first support shaft affixed to a first outer surface portion thereof and a second support shaft affixed to a second outer surface portion thereof which is diametrically opposed to said first outer surface portion thereof;

a forward camera portion defining a front opening which extends at least over an area corresponding to the area of said exposure compartment and the forward portion of which is defined by the front wall of said camera;

a first fixed shaft which extends across an upper end portion of said front opening;

a second fixed shaft which is located in a lower portion of said camera and which with respect to the front-to-rear dimension of said camera is in a generally central portion of said camera lower portion;

parallel quadrilateral linkage assemblies comprising a case means having a rear end portion pivotally mounted on said first fixed shaft, and on each side of said case a first link rod having one end pivotally mounted on said first fixed shaft and the opposite end thereof pivotally mounted on a first link pin located below and rearwardly of said first fixed shaft, a second link rod having one end pivotally mounted on said first link pin and the opposite end pivotally mounted on said second support shaft affixed to said second outer surface portion of said lens mount, and a third link rod having one end pivotally mounted on said second link pin and the opposite end pivotally mounted on a third link pin which is fixedly attached to a forward end portion of said case side, whereby said case may be moved to a first case position wherein said case is extended forwardly and downwardly with respect to said camera front wall and to a second case position wherein said case lies within said front opening of said camera and the outer cover of said case is on a plane generally level with that of said camera front wall, said lens mount being maintained at all times below the lower end portion of said case and being brought to a first lens mount position in which said lens mount is held forward of and clear of said camera front wall when said case is at said first case position and to a second lens mount position which is in the area of said front opening of said camera when said case is brought to said second case position;

a folding-box assembly comprising a rear box and a forward box, each said box comprising a bottom wall, two opposite side walls, and one end wall and defining an open top and an open end, said boxes having generally equal dimensions, having a width greater than that of and together defining a total space greater than that of said lens mount, and being in hinged attachment through a hinge element provided across the upper edges of said end walls thereof, the upper edge portions of said side walls of said rear box defining slots through which said second fixed shaft passes, whereby said rear box is pivotally and slidably movable about said second fixed shaft, and the forward end portions of the lower portions of said side walls of said forward box defining slots through which said first support shaft affixed to said first outer surface portion of said lens mount passes, whereby said lens mount is rotatable and slidable with respect to said forward box; and

an opaque hood element which has a front end portion attached to the rear portion of said lens mount and a rear end portion attached to the front portion of said exposure compartment, which when said lens mount is at said first lens mount position is extended and defines a hollow chamber, and which when said lens mount is moved to said second lens mount position is moved sideways and folded flat to a position wherein it lies generally level with the plane of said front portion of said exposure compartment.

4,075,646

MULTI-EXPOSURE DEVICE FOR CAMERA

Makoto Kurasawa, Tokyo, Japan, assignor to Taiwan Ricoh Co., Ltd., China /Taiwan

Filed Dec. 13, 1976, Ser. No. 749,811

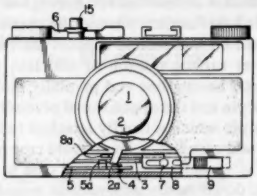
Claims priority, application Japan, Dec. 11, 1975, 50-167636[U]

Int. Cl.[2] G03B *19/02*

U.S. Cl. 354—209 **8 Claims**

1. A multi-exposure device for camera comprising a receiprocable shutter charging member, a self-cocking member for driving the shutter charging member to charge a shutter in

interlocked member for driving the charging member independently from the self-cocking member, and means interconnected with the operating member and adapted to be operated externally of a camera.



4,075,647

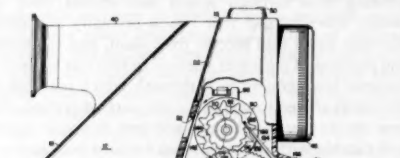
EXPOSURE COUNTER AND FLASH INHIBITING MEANS FOR A PHOTOGRAPHIC APPARATUS

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 648,673, Jan. 13, 1976, abandoned. This application Dec. 30, 1976, Ser. No. 755,913

Int. Cl.² G03B *17/36*

U.S. Cl. 354—217 **17 Claims**



1. Photographic apparatus comprising:

a housing including means defining a chamber for receiving a film cassette of the type including a plurality of film units;

a door coupled to said housing adjacent said chamber for movement between an open position wherein the cassette may be inserted into or removed from said chamber and a closed position wherein the cassette is secured within said chamber;

means for exposing each of the film units;

means cooperable with said exposure means for initiating an exposure cycle, said exposure initiating means being mounted for movement between a first position wherein it cannot be actuated to initiate an exposure cycle, to a second position wherein it may be actuated to initiate an exposure cycle, and a third position wherein an exposure cycle is initiated; and

means coupled to said exposure initiating means for automatically moving said exposure initiating means from said first position to said second position responsive to the insertion of a cassette into said chamber and subsequently moving said door into said closed position.

4,075,648

ELECTRIC SHUTTER MEANS EQUIPPED WITH A SELF-TIMER MECHANISM

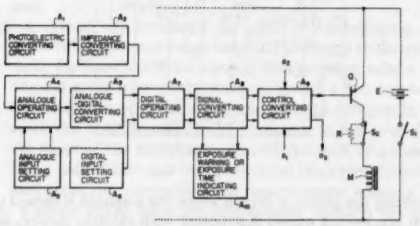
Nobuyoshi Inoue, and Munetaka Shimizu, both of Kawagoe, Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed May 5, 1975, Ser. No. 683,615

Claims priority, application Japan, May 10, 1975, 50-62738[U]

Int. Cl.² G03B *9/64*

U.S. Cl. 354—238 **2 Claims**



1. An electric shutter means comprising a controlling circuit including therein an electromagnet operable to terminate exposure, a current source switch selectively closed by actuation of a release button to connect said controlling circuit with a current source, an auxiliary switch connected in series with said electromagnet and in parallel with the current source switch, and a self-timer means including therein a sector gear arranged adjacently to said auxiliary switch and movable between a cocked position and an uncocked position for opening and closing said auxiliary switch, said auxiliary switch being opened by said sector gear when said sector gear is cocked, and said auxiliary gear being closed by said sector gear in a final stage of returning motion of said sector gear from its cocked position to its uncocked position.

4,075,649

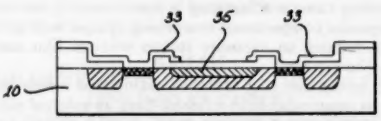
SINGLE CHIP TEMPERATURE COMPENSATED REFERENCE DIODE AND METHOD FOR MAKING SAME

Rudolph R. Verderber, Scottsdale, Ariz., assignor to Siemens Corporation, Scottsdale, Ariz.

Filed Nov. 25, 1975, Ser. No. 635,241

Int. Cl.² H01L *29/90*

U.S. Cl. 357—13 **8 Claims**



1. A single chip temperature compensated reference diode comprising:

a. a wafer of semiconductive material of one conductivity type;

b. a first layer of semiconductive material of an opposite conductivity type diffused through a surface of said wafer to form a first reverse PN junction;

c. a second layer of semiconductive material of an opposite conductivity type diffused through said surface of said wafer to form a second reverse PN junction extending substantially the same depth as said first reverse PN junction and laterally displaced from said first reverse PN junction;

d. a third layer of semiconductive material of an opposite conductivity type formed in said wafer, laterally contiguous to said first and second layers, to form a third reverse

PN junction, said third layer having a higher conductivity than said first and second layers, the reverse PN junctions formed by said first and second layers of semiconductive material laterally surrounding said third reverse PN junction to form a guard ring thereabout;

e. the reverse PN junctions formed by said first, second and third layers forming a continuous reverse PN junction with portions thereof having a lower breakdown voltage than the remainder of the reverse junction; and

f. a fourth layer of semiconductive material of said one conductivity type diffused into said first layer to form a forward PN junction.

4,075,650

MILLIMETER WAVE SEMICONDUCTOR DEVICE

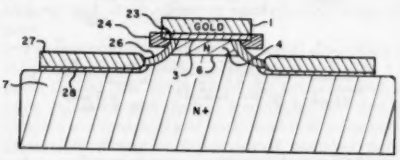
Joseph A. Calviello, Kings Park, N.Y., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Apr. 9, 1976, Ser. No. 675,621

The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.

Int. Cl.[2] H01L *29/48*

U.S. Cl. 357—15 **6 Claims**



1. A gallium arsenide microwave semiconductor device, comprising:

(a) a body of N+ doped gallium arsenide semiconductor material with a carrier concentration in the range of about 1×10^{18} to 1×10^{19} per cubic centimeter,

(b) a mesa located on the upper surface of the body and formed of N doped gallium arsenide at a carrier concentration in the range of about 1×10^{16} to 5×10^{17} per cubic centimeter,

(c) a first contacting layer of tantalum in contact with the upper surface of the mesa to form a Schottky barrier diode junction at the interface of the contacting layer and the mesa, said first contacting layer extending along the plane of the upper surface of the mesa beyond the periphery of the Schottky junction, and the surface on the side of the mesa adjacent the Schottky junction being approximately perpendicular to the plane of the upper surface of the mesa,

(d) a second contacting layer located substantially in a plane below the plane of the upper surface of said mesa with a thickness of at least one skin depth at the operation frequency in contact with and extending over at least a portion of the upper surface of the body about the base of the mesa,

(e) a first electrode connected to and extending over the upper surface of the first contacting layer,

(f) a second electrode connected to and extending over the upper surface of the second contacting layer,

(g) the exposed edge of said first contacting layer passivated with tantalum oxide, and

(h) the surface of the device between the first and second electrode passivated with native oxide.

4,075,651

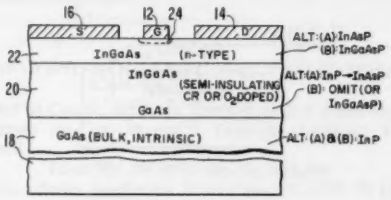
HIGH SPEED FET EMPLOYING TERNARY AND QUARTERNARY III-V ACTIVE LAYERS

Lawrence W. James, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Mar. 29, 1976, Ser. No. 671,189

Int. Cl.[2] H01L *29/203, 29/80, 47/00*

U.S. Cl. 357—22 **11 Claims**



1. A high-speed field effect transistor comprising an active epitaxial layer of a predetermined conductivity type, a rectifying gate contact and ohmic source and drain contacts on said active layer, said gate contact being positioned to control current flow between said source and drain contacts, said active layer comprising a compound of at least three elements selected from columns III and V of the Periodic Table and doped to be of a predetermined conductivity type, said compound being $In_{1-x}Ga_xAs_{1-y}P_y$ where x + y is greater than 0.5 and less than 1.

4,075,652

JUNCTION GATE TYPE GAAS FIELD-EFFECT TRANSISTOR AND METHOD OF FORMING

Shotaro Umebachi, Takatsuki; Gota Kano, Nagaoka-Kyo, and Morio Inoue, Takatsuki, all of Japan, assignors to Matsushita Electronics Corporation, Japan

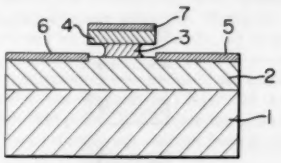
Continuation of Ser. No. 567,537, April 14, 1975, abandoned.

This application May 5, 1977, Ser. No. 793,969

Claims priority, application Japan, Apr. 17, 1974, 49-44324

Int. Cl.[2] H01L *29/80, 29/161, 29/06, 29/167*

U.S. Cl. 357—22 **2 Claims**



1. A junction gate type field-effect transistor comprising a semiconductor substrate of p-type GaAs,

a semiconductor layer of n-type $Ga_{1-x}Al_xAs$ ($0 \leqq x \leqq 0.1$),

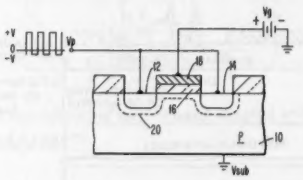
a semiconductor gate region of p-type $Ga_{1-y}Al_yAs$ ($0.2 \leqq y \leqq 0.8$) forming a heterojunction with said n-type layer,

an electrode region of p-type $Ga_{1-z}Al_zAs$ ($0 \leqq z \leqq 0.1$) contiguous with said gate region, the width of said gate region being less than the width of said electrode region; and first and second ohmic electrodes disposed of said n-type layer and spaced apart from each other by said gate and electrode regions, whereby the conductivity of said semiconductor layer may be controlled by the electric field across said heterojunction.

4,075,653
METHOD FOR INJECTING CHARGE IN FIELD EFFECT DEVICES

Lowell Francis Howard, Essex Junction, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1976, Ser. No. 743,253
Int. Cl.[2] H01L *29/78, 29/40*
U.S. Cl. 357—23 **8 Claims**



7. A test structure for evaluating the effects of leakage induced threshold shift comprising:

an insulated gate field effect transistor having source and drain electrodes, a gate electrode for controlling a channel region, and a substrate;

means for applying a fixed potential between said gate electrode and said substrate, said fixed potential being of a magnitude and polarity to cause the formation of a depletion region in said channel region; and

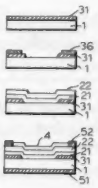
means for coupling both of said source and drain electrodes to a source of bipolarity pulses for biasing said source and drain electrodes in alternating forward and reverse bias conditions with respect to the potential of said substrate;

whereby minority carriers injected into the substrate of said transistor during said forward bias condition are injected into the insulated gate of said transistor during said reverse bias condition.

4,075,654
SEMICONDUCTOR PHOTOELECTRON EMISSION DEVICE

Katsuo Hara; Minoru Hagino, and Tokuzo Sukegawa, all of Hamamatsu, Japan, assignors to Hamamatsu Terebi Kabushiki Kaisha, Hamamatsu, Japan

Division of Ser. No. 647,761, Jan. 9, 1976, which is a division of Ser. No. 455,231, March 27, 1974, Pat. No. 3,953,880. This application Oct. 26, 1976, Ser. No. 735,333
Int. Cl.[2] H01L *27/14, 29/161*
U.S. Cl. 357—30 **5 Claims**



1. A semiconductor photoelectron emission device comprising

an electrode;

a base of direct transition semiconductor of p-type GaSb having an impurity concentration of about 10^{17} to 10^{19} atom/cm^3;

a first layer of n-type GaSb having a thickness of about 10μm epitaxially grown on and covering selected parts of said base;

a second layer of indirect transition semiconductor of $Al_{(1-x)}Ga_xSb$, wherein x is less than 1 and a positive number, having a wide forbidden band and low impurity concentration and of 500 A to 10μm thickness and defining a heterojunction with said base, said base and said second layer having substantially the same crystal structure at said junction and having small differences in lattice constants;

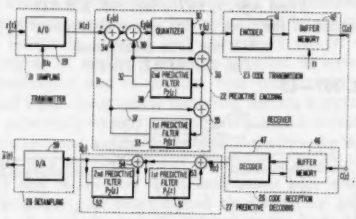
a third layer of $Al_{(1-x)}Ga_{(1-x)}Sb$ having a narrower forbidden band and with an electron emissive surface; and

ohmic contacts.

4,075,655
COMPOSITE FEEDBACK PREDICTIVE CODE COMMUNICATION SYSTEM FOR A COLOR TV SIGNAL INCLUDING A CARRIER CHROMINANCE SIGNAL

Yukihiko Iijima; Kazumoto Iinuma, and Tatsuo Ishiguro, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1976, Ser. No. 673,327
Claims priority, application Japan, Apr. 3, 1975, 50-40619; Nov. 19, 1975, 50-139024
Int. Cl.[2] H04N *9/32*
U.S. Cl. 358—13 **36 Claims**



1. a predictive code communication system for a color television signal including a carrier chrominance signal component which comprises a transmitter and a receiver;

said transmitter comprising:

sampling means for sampling said television signal to produce signal samples;

predictive quantizing means responsive to said signal samples for producing quantized prediction error signals in comliance with a first overall transfer characteristic defined by a product of a first difference $1 - P_1$ and a second difference $1 - P_2$, where P_1 represents a first transfer function of frequencies and P_2 represents a second transfer function of frequencies, the absolute value of one of said first and second differences being a minimum which is sufficiently smaller than unity at least in the neighborhood of an integral multiple (including unity) of the frame frequency of said television signal, the absolute value of the other of said first and second differences being those minima which are sufficiently smaller than unity at least in the neighborhoods of zero frequency and the subcarrier frequency for said carrier chrominance signal component; and

code transmission means responsive to said quantized prediction error signals for transmitting predictive encoded signals to said receiver;

said receiver comprising:

code reception means responsive to said predictive encoded signals for producing reproduced prediction error signals;

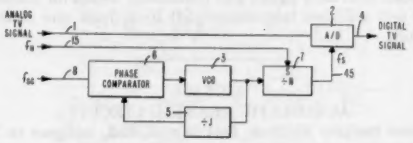
predictive decoding means responsive to said reproduced prediction error signals for producing samples in compliance with a second overall transfer characteristic which is an inverse of said first overall transfer characteristic; and

desampling means responsive to said reproduced samples for producing a reproduction of said television signal.

4,075,656
CIRCUIT FOR DIGITALLY ENCODING AN ANALOG TELEVISION SIGNAL

Daniel A. Beaulier, Menlo Park, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Jan. 26, 1977, Ser. No. 762,901
Int. Cl.[2] H04N *7/04, 9/32*
U.S. Cl. 358—13 **10 Claims**



1. A circuit for digitally encoding by sampling an analog television signal having synchronizing components including a horizontal sync pulse, said signal having a known horizontal blanking period, comprising:

a means for generating a clock signal having a frequency equal to a first integral multiple of a desired frequency of a sampling signal and to a second integral multiple of a frequency of a synchronizing component of said analog television signal, said desired sampling signal frequency being a non-integral rational multiple of the frequency of the horizontal sync pulse;

a means coupled to a source of said synchronizing component and to said clock signal generating means for phase-locking said clock signal to said synchronizing component;

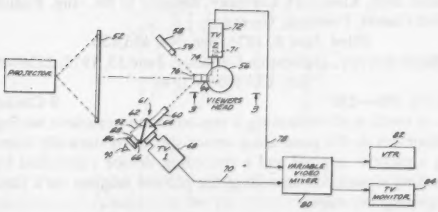
a first means coupled to said clock signal generating means for dividing the frequency of said clock signal by a factor equal to said first integral multiple for providing a sampling signal of said desired frequency, said first means coupled to a source of said horizontal sync pulse and being presettable during each horizontal blanking period to provide a sampling signal whose phase is the same as the beginning of each horizontal line of said television signal; and

an analog-to-digital encoder coupled to receive both said analog television signal and said sampling signal for providing at an output a digitally encoded television signal.

4,075,657
EYE MOVEMENT MONITORING APPARATUS

Lee S. Weinblatt, 797 Winthrop Road, Teaneck, N.J. 07666

Filed Mar. 3, 1977, Ser. No. 773,899
Int. Cl.[2] H04N *7/18*
U.S. Cl. 358—93 **25 Claims**



1. Apparatus for determining the eye movements of a viewer in response to visual stimuli comprising:

a screen for displaying said stimuli;

support means placed at a preselected distance in front of said screen for maintaining the viewer's head in a relatively fixed position;

means for monitoring the viewer's eye movements;

means for monitoring said stimuli displayed on the screen and placed in front of the torso of said viewer, said stimuli monitoring means extending generally parallel to said screen;

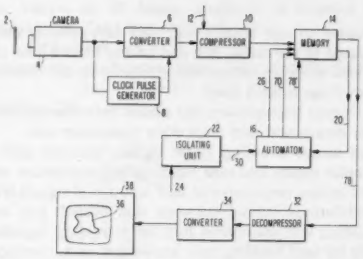
lens means aimed at said screen and attached to said stimuli monitoring means adjacent said support means and below viewer eye level for receiving light from said screen and for transmitting it into said image monitoring means; and

means for combining the outputs of both said monitoring means to superimpose the viewer's eye movements on the displayed stimuli.

4,075,658
METHOD AND DEVICE FOR ISOLATING FIGURES IN AN IMAGE

Bertrand de Cosnac, and Alain Spiwack, both of Paris, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 29, 1976, Ser. No. 681,300
Claims priority, application France, Apr. 29, 1975, 75 13434
Int. Cl.[2] H04N *7/18*
U.S. Cl. 358—96 **10 Claims**



1. A method of isolation of figures in an image, in which the graphic information contained in the image is converted by means of a television camera to a video signal constituted by a succession of lines, each line being in turn constituted by an electrical analog signal having an amplitude which is variable in time, in which each line is then sampled sequentially at uniform time intervals so as to obtain an ordered series of points having associated numerical values which are a function of the level of blackening of the points of the initial image, and in which said ordered series of points is stored in a memory device, wherein said method consists in selecting a parent point forming part of an isolated figure of the image, wherein all those points of said fi_ure in which the level of blackening on the image is higher than an adjustable threshold value are isolated automatically by marking with the aid of an isolating automaton coupled with said memory device, wherein all the marked points corresponding to said figure are extracted from the memory device and wherein said figure of the image is reconstituted from said points, whereupon the process of isolation is repeated for another figure, starting from another parent point.

4,075,659
ELECTRONIC DOOR ANNOUNCER

Etiennette Romani Desanti, "Le Clos des Oliviers " 80, avenue de Lattre de Tassigny, 06400 Cannes, France

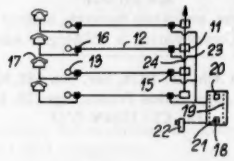
Continuation of Ser. No. 387,657, Aug. 13, 1973, abandoned.
This application Sept. 25, 1975, Ser. No. 616,643
Claims priority, application France, Sept. 8, 1972, 72.31853
Int. Cl.[2] H04N *7/18*
U.S. Cl. 358—108 **15 Claims**

1. In an electronic door announcer system for multiple unit buildings including a main door announcer unit and at least one individual building unit announcer unit and a master antenna system having a coaxial cable network comprised of at least one coaxial trunk line and at least one coaxial branch line

coupled to said trunk line for utilizing said coaxial cable network as the signal transmission means for said door announcer system, said branch line being fed to a building unit including said at least one announcer unit, the improvement comprising:

circuit means including a high frequency modulator, adapted to modulate signals originating in said main door announcer unit, coupled to said trunk line in the region of said door announcer unit for transmitting modulated signals to said building unit via said branch line;

first and second bidirectional signal coupler means for audio frequency signals originating at said main door announcer unit and said building unit announcer unit, respectively,



coupled to said branch line, said first coupler unit being located at the trunk line end of the branch line and said second coupler means being located at the building unit end of the branch line;

audio signal transmission line means between said first coupler means and said main door announcer unit;

circuit means coupling audio signals between said second coupler means and said building unit announcer unit; and

circuit means, responsive to said modulated signals from said modulator, coupled between said branch line and said building unit announcer unit for providing signals, utilizable by said building unit announcer unit, corresponding to signals originating at said main door announcer unit.

4,075,660

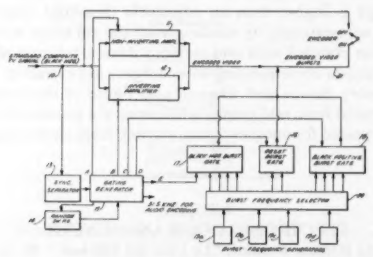
PAY TELEVISION SYSTEM WITH SYNCHRONIZATION SUPPRESSION

Irving Horowitz, Eatontown, N.J., assignor to Teleglobe Pay-TV System, Inc., Rego Park, N.Y.

Division of Ser. No. 429,216, Dec. 28, 1973, Pat. No. 3,924,059, which is a continuation of Ser. No. 227,582, Feb. 18, 1972, Pat. No. 3,824,332. This application July 23, 1975, Ser. No. 598,384

Int. Cl.[2] H04N *1/44*

U.S. Cl. 358—124 **6 Claims**



1. Encoding apparatus for a subscription television system, comprising, in combination, means for furnishing a television signal having a predetermined black level signifying picture black and having a plurality of vertical retrace intervals, each including a sequence of horizontal intervals separated by horizontal synchronization pulses, said horizontal synchronizing pulses having a predetermined synchronizing polarity relative to said black level; pulse generator means for furnishing a sequence of substantially identical pulses; inserting means connected to said pulse generator means and said means for furnishing a television signal, for inserting a first, second and third one of said substantially identical pulses into, respectively, a first, second and third predetermined one of said horizontal intervals within each of said vertical retrace intervals at a polarity opposite to said synchronizing polarity and at a predetermined time instant following a first, second and third predetermined one of said horizontal synchronizing pulses, each immediately following the corresponding one of said first, second and third horizontal intervals, thereby creating an encoded television signal; and transmitter means for transmitting said encoded television signal to at least one receiver location.

4,075,661

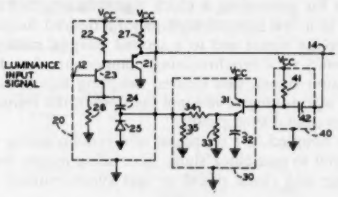
AUTOMATIC PEAKING CIRCUIT

Charles Buckner Heffron, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Aug. 19, 1976, Ser. No. 715,768

Int. Cl.[2] H04N *5/14*

U.S. Cl. 358—166 **9 Claims**



1. An automatic frequency compensation apparatus for maintaining a predetermined amount of high frequency content in a video signal comprising:

a. a video amplifier having an input terminal for receiving said video signal and an output terminal, said amplifier having a selectable gain frequency response;

b. means for sampling the high frequency content of a signal at said output terminal; and

c. control means for changing the slope of the gain-frequency response of said amplifier, said control means being operatively connected to said means for sampling whereby a decrease in the amount of high frequency content at said amplifier output terminal will cause the slope of said amplifier gain-frequency response to increase positively.

4,075,662

METHOD AND SYSTEM FOR COMPENSATING THE NON-LINEARITIES IN A REPRODUCTION PROCESS

Winrich Gall, Klausdorf, Germany, assignor to Dr. -Ing. Rudolf Hell GmbH, Postfach, Germany

Filed June 8, 1976, Ser. No. 693,938

Claims priority, application Germany, June 13, 1975, 2526409

Int. Cl.[2] H04N *1/40*

U.S. Cl. 358—280 **9 Claims**

1. A method of calibrating a reproduction apparatus having a sensor device for generating sensor signals by optically scanning a picture original and a recording device controlled by recording signals for recording the picture original on a film, comprising the steps;

generating a set of first signals for said recording device to produce a sample gray scale on the film having a predetermined first range of gray scale values;

generating and storing a set of second signals corresponding respectively to said first signals;

generating a set of third signals corresponding substantially to the gray scale values of said sample recorded gray scale;

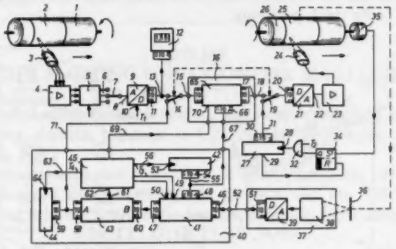
correlating said third signals to said first signals;

generating a set of fourth signals representing a predeter-

mined second range of gray scale values of a reference gray scale;

substantially correlating a first group of at least some of said fourth signals to a second group of at least some of said third signals for obtaining said second signals; and

storing said second signals in a storage device having addresses corresponding to the fourth signals of said first group, whereby a substantially generated sensor signal for a given gray scale value by the picture original can be used to select a recording signal from a stored second signal of said second group by a correlated fourth signal suitable for obtaining a substantially duplicate gray scale value.



4,075,663

METHOD FOR THE RASTERED REPRODUCTION OF HALF-TONE PICTURES PROVIDING CHANGES IN THE INDIVIDUAL PICTURE ELEMENTS DURING TRANSFER FROM AN ORIGINAL TO A REPRODUCTION

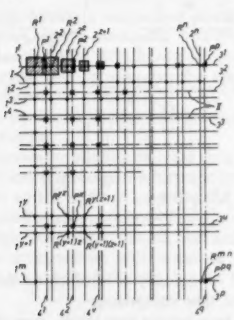
Klaus Wellendorf, Kitzeberg, near Kiel, Germany, assignor to Dr. -Ing. Rudolf Hell GmbH, Germany

Filed Mar. 17, 1976, Ser. No. 667,504

Claims priority, application Germany, Mar. 19, 1975, 2511922; Sept. 16, 1975, 2541138

Int. Cl.[2] H04N *1/06*

U.S. Cl. 358—283 **15 Claims**



1. The method for the rastered reproduction of half-tone pictures with changes in the picture-element break-up process during transfer from the original to the reproduction with the aid of electronically stored recording data in a randomly variable scale, the steps include:

scanning the picture according to the finest scale necessary, encoding and digitally storing the ascertained values,

reproducing a picture comprising the following steps:

removing the gray scale value data of four corner points of a mesh square of the original raster network of the model picture from the memory,

locating one or more picture elements of the new raster network for the reproduced, picture which is to be recorded,

calculating by means of linear interpolation the data to be recorded according to the picture scanning elements,

said calculating is done according to the following formula:

$$N = \frac{\frac{Ab + Ba}{aa + b} \cdot d + \frac{Cb + Da}{a + b} \cdot c}{c + d},$$

where N is the gray scale value of the new picture element, A, B, C, D are the gray scale values of the corner points of the mesh square of the original raster network in which the new picture element is located, and

a, b, c, d are the coordinates of the point from the vertical and horizontal lines of the network square in which the point is located.

4,075,664

FACSIMILE SCANNING DEVICE

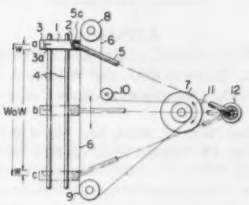
Ren Aoki; Mitsugu Fujiwara, both of Hanamaki, and Tasaku Wada, Tokyo, all of Japan, assignors to Yamura Shinko Seisakusho Co., Ltd., Hanamaki, Japan

Filed Feb. 22, 1977, Ser. No. 770,784

Claims priority, application Japan, Mar. 4, 1976, 51-23591

Int. Cl.[2] H04N *1/10, 1/24*

U.S. Cl. 358—286 **3 Claims**



1. A linear scanning system for a facsimile system comprising; a carrier movable linearly in both directions supported on a belt, a pulse motor engaged with said belt, a write-head mounted on said carrier, an optical fibre assembly composed of at least one thick emission fibre and a thin receiving fibre, a read-head composed of the end of said optical fibre assembly, a lamp positioned at the other end of said emission fibre, a photo-electric convertor positioned at the end of said receiving fibre, a bearing positioned on a center line perpendicular to the direction of travel of said carrier and said carrier supporting said optical fibre assembly near said other end, and said carrier being controlled to scan an original paper and a printing paper in both directions.

4,075,665

METHOD AND APPARATUS FOR INCREASING THE RECORDING CAPACITY OF A DISK

Jean Paul Borne, Saint-Maur, and Geert Jan Naaijer, Limeil-Brevannes, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 7, 1976, Ser. No. 703,302

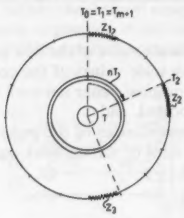
Claims priority, application France, July 9, 1975, 75 21530

Int. Cl.[2] G11B *5/012*

U.S. Cl. 360—8 **21 Claims**

1. A method of recording and reproducing *x* information signals, wherein *x* is an integer, on a disc-shaped record carrier driven at a substantially constant speed of revolution V in cooperation with a read/write head, comprising dividing each of the information signals during reading into consecutive information segments of equal duration τ_p, sampling each information segment and storing the sampled information in a first memory with a first clock frequency *f*, said first clock fre-

quency being at least twice the highest frequency of the information signals, reading the stored information signals out of the first memory and recording the stored information on the record carrier at a second clock frequency F that is higher than the first clock frequency f, playing back the recorded material onto a second memory at the frequency F, and reading the material out of the second memory at a frequency f, synchro-



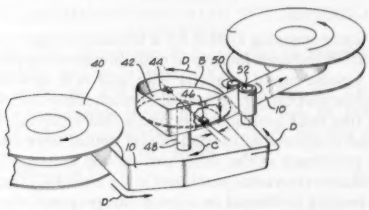
nizing the two clock frequencies f and F relative to the speed of revolution V of the record, the magnitude of the frequencies f and F and the magnitude of the period τ_i of the information segments being selected in such a way that $\tau_i < F/f^2$, and that for the time interval t_i during which each information segment is recorded on the carrier the expression $t\,f/F < t_i < 1/f$ is valid.

4,075,666

MAGNETIC TAPE RECORDER

John A. Lomax, Redwood City, and William J. Martin, Sunnyvale, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Nov. 12, 1964, Ser. No. 410,531
Int. Cl.[2] H04N *5/78;* **G11B** *27/36*
U.S. Cl. 360—11 **13 Claims**



1. A slow speed magnetic tape recorder having a rotary head drum, a first magnetic head mounted on the periphery of the head drum, a second magnetic head mounted on the periphery of the head drum and so positioned relative to said first magnetic head that it will re-scan the same track on a tape being played on the recorder that was previously scanned by the first magnetic head.

4,075,667

METHOD AND APPARATUS FOR ALIGNING READ/WRITE HEADS IN A DISC RECORDER

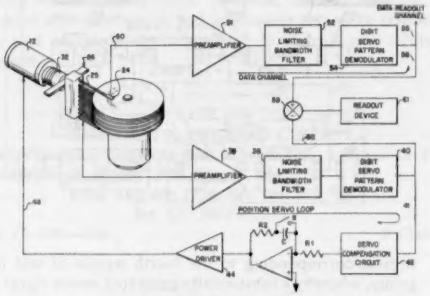
Andrew M. Rose, Santa Clara, and Brian Paul Tremaine, San Jose, both of Calif., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,608
Int. Cl.[2] G11B *21/10*
U.S. Cl. 360—77 **3 Claims**

1. In a recording device for recording data on a medium and having a plurality of read/write heads and a servo head mounted for simultaneous movement on a carriage effected by energization of an actuator acting responsive to a servo signal detected by the servo head, and wherein the read/write heads are mounted in a manner to allow fine position adjustment relative to the servo head;

the method of aligning the read/write heads relative to the servo head comprising the steps of:

placing on the recording device a medium having prerecorded aligned signals positioned to be detected by the read/write heads and servo head simultaneously to indicate track positions;



detecting the signals read by the servo head and the read/write heads;

subtracting the signals of one read/write head from the signal of the servo head to generate a differential signal; and

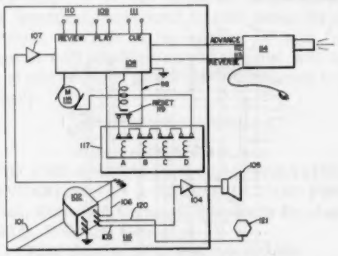
manually fine adjusting the position of said one read/write head to minimize said differential signal.

4,075,668

DIGITAL LOGIC CONTROL FOR AUDIO VISUAL PROGRAMS AND METHOD THEREFOR

Bernard C. Keach, Torrance, Calif., assignor to Educational Electronics of California Inc., Inglewood, Calif.

Filed Dec. 18, 1975, Ser. No. 642,051
Int. Cl.[2] G03B *31/00;* **G11B** *31/00;* **G09B** *1/00;* **G03B** *21/00*
U.S. Cl. 360—80 **6 Claims**



4. The method of logically controlling an audio visual program by magnetic tape comprising:

a. preparing a tape having two tracks, one of which carries an audio program to describe the visual program and a signal track which carries two detectable control tones one of which is a tape stop tone and the other of which is a projector frame change tone, and said tape being driven by a drive motor having off time during which the tape drive stops momentarily while the visual program changes one frame,

b. subjecting the detected signal control tones of the signal track to a digital logic circuit with combinations of play, review and cue switch closures which provide a first and second operating mode for the digital circuit, said digital circuit in a first mode controlling the audio program on the tape in sync with the projector frame presentation regardless of tape speed or direction, and

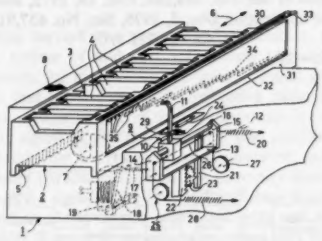
c. in a second mode to provide adjustable and automatic control of the "off" time, of the drive motor during advance or reverse signals allowing the control of projectors with differing operating speeds and characteristics to complete an operation while searching the tape in high speed either varying or constant, either forward or reverse.

4,075,669

INDEX MARKING FOR A CASSETTE MAGAZINE APPARATUS

Friedrich Louzil; Gerhard Habelt, and Gustav Mrazek, all of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 559,739, March 19, 1975, abandoned. This application Sept. 23, 1976, Ser. No. 725,782
Claims priority, application Austria, Mar. 22, 1974, 2382/74
Int. Cl.[2] G11B *15/68, 23/04*
U.S. Cl. 360—92 **6 Claims**



1. An improved recording and/or playback apparatus for record carriers accommodated in tape cassettes, comprising a magazine having a plurality of chambers for accommodating cassettes containing record carrier tapes, means for positioning said magazine to align a selected chamber for scanning, and means for scanning a track on the tape of the cassette associated with the selected chamber, wherein the improvement comprises:

an index strip having a respective plurality of index strip sections, one section associated with each cassette,

means for holding said strip on the magazine, each section being aligned at a location on the magazine associated with the respective cassette,

a strip mark device for marking or sensing marks at a point along a section,

mounting means for holding the said strip mark device at a starting position associated with the location of the section associated with a selected cassette, and

means, responsive to operation of said scanning means, for moving said strip mark device past said associated strip section in synchronism with scanning of a track on the carrier of the selected cassette.

4,075,670

TAPE AUTO-LOADING RECORDING AND REPRODUCING APPARATUS

Yoshiteru Namoto, Moriguchi, and Hideki Sakumoto, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 17, 1976, Ser. No. 658,759
Claims priority, application Japan, Feb. 19, 1975, 50-21175; Aug. 4, 1975, 50-95225
Int. Cl.[2] G11B *15/66*
U.S. Cl. 360—85 **2 Claims**

1. A rotary head type magnetic recording and reproducing apparatus for use with a tape cassette having a supply reel, a take-up reel, a magnetic tape wound on said supply and take-up reels and means for feeding said magnetic tape adjacent an opening in one side of said cassette from said supply reel to said take-up reel, said apparatus comprising:

a tape-driving capstan;

a cylinder enclosing a rotary head;

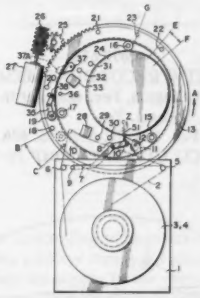
a rotary ring located for rotation around said cylinder;

driving means for selectively rotating said rotary ring in forward and backward directions about said cylinder;

tape pull-out means including a tape pull-out post mounted on said rotary ring for engaging the magnetic tape within said cassette, pulling the tape from said cassette and wrapping it around said cylinder at a predetermined angle in accordance with the rotation of said rotary ring;

a pinch roller supporting arm mounted rotatably on said rotary ring for rotatably supporting thereon a pinch roller;

cam means for engagement with said pinch roller supporting arm after said magnetic tape has been wrapped around said cylinder by rotation of said tape pull-out post in said forward direction on said rotary ring, said cam means



rotating said pinch roller supporting arm to place said pinch roller and said capstan into contact with each other during the recording-reproducing mode of said apparatus as said rotary ring rotates in said forward direction for withdrawing said magnetic tape from said cassette, the engagement between said cam means and said pinch roller supporting arm and the engagement between said pinch roller and said capstan being released when said rotary ring is rotated in said backward direction;

a tape anti-slacking pin for contacting said magnetic tape after it has been withdrawn from said cassette to provide tension thereto;

means for releasing said tape anti-slacking pin from contact with said magnetic tape; and

means for resetting said releasing means after a predetermined length of said magnetic tape has been withdrawn from said cassette by rotation of said rotary ring for placing said tape anti-slacking pin into pressure contact with said magnetic tape.

4,075,671

AUTOMATIC AC BIASING OF A MAGNETORESISTIVE ELEMENT

Samuel David Cheatham, Arvada, and Julian Lewkowicz, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 24, 1976, Ser. No. 744,839
Int. Cl.[2] G11B *5/30*
U.S. Cl. 360—113 **8 Claims**

1. A magnetic read head circuit comprising:

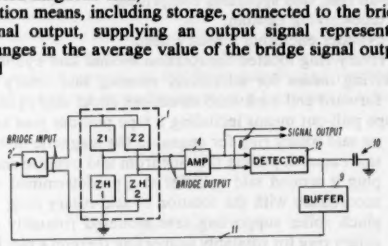
a source of magnetic flux manifesting recorded information;

bias means for supplying an alternating current bias signal having an adjustable amplitude;

a pair of elements exhibiting a magnetoresistive effect, intercepted by said magnetic flux, connected with a pair of impedance elements in a bridge arrangement having a signal input connected to the bias means, and a signal

output which is a function of the bias signal and the intercepted magnetic flux;

detection means, including storage, connected to the bridge signal output, supplying an output signal representing changes in the average value of the bridge signal output; and



feedback means interconnecting the detection means output and the bias means for adjusting the bias signal amplitude as a function of the detection means output to maintain the bridge signal output at a predetermined constant average value.

4,075,672

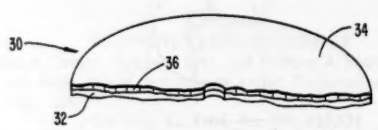
MAGNETIC RECORDING MEMBERS

William A. Manly, Arlington, Tex., assignor to Graham Magnetics Incorporated, Graham, Tex.

Filed Feb. 9, 1976, Ser. No. 656,171

Int. Cl.[2] G11B *5/82;* H01F *10/02*

U.S. Cl. 360—135 **5 Claims**



1. A magnetic recording member of the floppy disk type consisting essentially of a substrate and a magnetic recording layer of up to about 100 microinches in thickness and comprising metallic magnetic recording particles, dispersed in a binder, said particles oriented in a direction normal to the plane of the surface of said disk.

4,075,673

OPERATING SYSTEM FOR GENERATOR CIRCUIT-BREAKERS

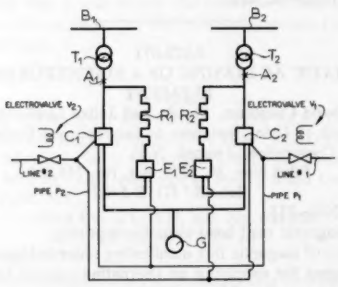
Edmond Thuries, Pusignan, France, assignor to Delle-Alsthom S.A., Villeurbanne, France

Filed Aug. 11, 1976, Ser. No. 713,474

Claims priority, application France, Aug. 11, 1975, 75 25000

Int. Cl.[2] H01H *9/42*

U.S. Cl. 361—10 **8 Claims**



1. An electrical power supply system comprising: a generator, a plurality of separate load circuits, said generator being connected to each load circuit by a generator circuit-breaker corresponding to the load circuit, each generator circuit-breaker comprising a main cut-out chamber shunted by an auxiliary cut-out chamber connected in series with a power-dropping impedance, and means for operating said circuit-breakers associated with said generator in the event of a short-circuit failure occurring on one of the load circuits, in the following sequence: firstly, to open the main chamber of each circuit-breaker which is not connected to the failure; secondly, to open the main cut-out chamber of the circuit-breaker which is connected with the failure; thirdly, to open the auxiliary cut-out chamber of the circuit breaker connected to the failure; and finally, to close the main cut-out chamber of each circuit-breaker not connected to the failure.

4,075,674

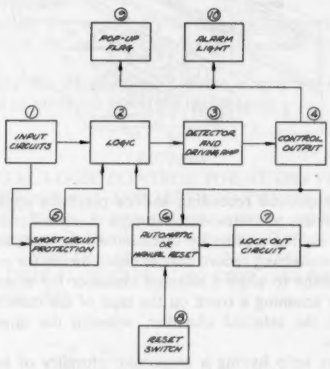
EXPANDABLE ELECTRONIC PROTECTION SYSTEM

David J. Squiers, Attleboro Falls, and Robert E. Obenhaus, South Easton, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 316,194, Dec. 18, 1972, abandoned. This application Dec. 5, 1975, Ser. No. 637,912

Int. Cl.[2] H02H *5/04*

U.S. Cl. 361—27 **4 Claims**



1. A protection circuit which comprises,

a. a source of power,

b. a first switch means in series with said source of power,

c. circuit means responsive to an alarm condition to open said first switch means, and

d. lockout means responsive to opening of said switch to maintain said switch open upon removal of said alarm condition, said circuit means includes a second switch means responsive to said alarm condition to open said first switch means and said lockout means includes means responsive to opening of said first switch means to close said second switch means.

4,075,675

GROUND CONDUCTOR MONITORING SYSTEM AND METHOD

Joseph C. Burkett, Bramwell, and Harry L. Harshbarger, Bluefield, both of W. Va., assignors to Genoa Coal Company, Gary, W. Va.

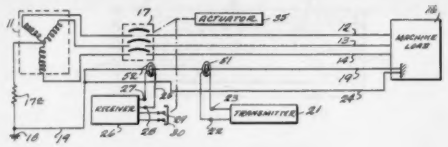
Continuation-in-part of Ser. No. 557,901, March 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 431,325, Dec. 28, 1973, abandoned. This application May 21, 1976, Ser. No. 688,553

Int. Cl.[2] H02H *1/02*

U.S. Cl. 361—48 **6 Claims**

1. In a power transmission system including a power source and a load and a plurality of power transmission cables extending between the power source and the load and further includ-

ing a continuous, uninterrupted ground conductor extending between the source and load, and being directly connected to the source ground and directly connected to frame ground of the load, a monitoring system for monitoring electrical continuity of the ground conductor comprising a transmitter for transmitting a signal having a predetermined frequency within the audio range over the ground conductor, said transmitter signal being coupled to the ground conductor only through a closed inductive system comprising a first toroid surrounding said ground conductor, a receiver, said receiver being coupled to the ground conductor only through an additional closed inductive system comprising a second toroid surrounding said ground conductor and functioning to continuously receive said



signal being carried over the ground conductor, said closed inductive system of said first and second toroids forming a closed system for monitoring continuity of said ground conductor so that possible parallel conductive paths which may extend from frame ground of the load to source ground cannot couple any signal to said receiver from said transmitter if said ground conductor is broken or open circuited, and whereby such possible parallel paths will not have any shunting effect on the receiver signal if the ground conductor is not open-circuited, and an alarm device associated with and actuated by said receiver to provide an indication when said revceiver no longer receives said signal, thereby indicating that an open circuit or high impedance condition exists in said ground conductor.

4,075,676

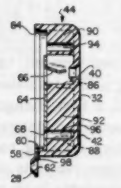
INTERRUPTER

Charles M. Phillips, Jr., 315 Haven St., Clearwater, Fla. 33516

Filed Dec. 24, 1975, Ser. No. 644,422

Int. Cl.[2] H02H *3/20*

U.S. Cl. 361—56 **4 Claims**



1. A device for interrupting electrical current used by a household electrical appliance comprising:

a housing supporting a pair of prong means and a grounding prong means adapted to be inserted into a grounded electrical receptacle and a female receptacle adapted to be electrically connected to an appliance, said female receptacle including three apertures;

a plurality of means for electrically interconnecting said prong means and a corresponding element of said female receptacle, said plurality of interconnecting means including three non-fusible conductive elements being unitary portions of said three prong means and forming contact portions below said apertures of said female receptacle, and one of said conductive elements is rectangular having an L-shaped grounding prong means extending from one end of said conductive element in a first direction and a contact portion extending from the other end of said conductive element in a direction opposite said first direction; and

a means connected between two of said interconnecting means for interrupting current flow to said female receptacle at a predetermined voltage level by creating a path of minimum resistance between said two interconnecting means.

4,075,677

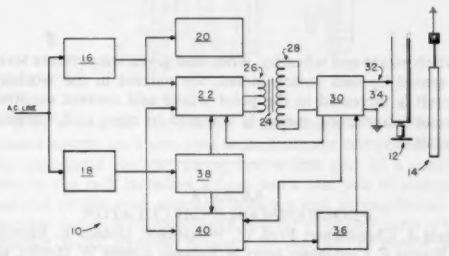
ELECTROSTATIC COATING SYSTEM

Stanley L. Bentley, Indianapolis, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Filed Aug. 9, 1976, Ser. No. 712,781

Int. Cl.[2] H02H *3/08*

U.S. Cl. 361—93 **30 Claims**



1. A system for controlling voltage across a pair of out-put terminals including a power supply for generating the voltage, means for coupling the supply to the output terminals, means for sensing the output current flowing between the terminals, means for disrupting the impressed voltage, the disrupting means being coupled to the terminals and having at least one control electrode, a control circuit, first circuit means for coupling the control circuit to the sensing means for providing an output current-related signal at a terminal of the control circuit, the control circuit including second circuit means for generating a first input signal related to the output current-related signal by a predetermined selectively variable fixed difference, sample-and-hold circuit means for sampling the first input signal during successive sampling intervals and for storing the value of the first input signal between successive sampling intervals, and a first comparator for comparing the stored value to the current-related signal and for generating a first output signal when the current-related signal exceeds the stored value, and means for coupling the first comparator to the control electrode, the first output signal controlling the disrupting means, the improvement wherein the control circuit further includes third circuit means for generating a second input signal related to the first input signal by a predetermined, selectively variable multiplier, and a second comparator for comparing the stored value to the second input signal when the second input signal exceeds the stored value, and means for coupling the second comparator to the control electrode, the second output signal also controlling the disrupting means.

4,075,678

FAIL SAFE CIRCUIT FOR HEAT GENERATING DEVICE

Robert N. Levinn, Catskill, N.Y., assignor to American Thermostat Corporation, Cairo, N.Y.

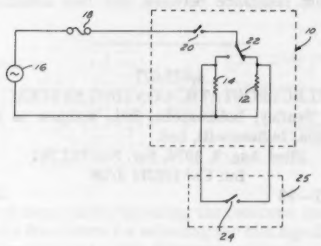
Filed Feb. 13, 1976, Ser. No, 657,742

Int. Cl.[2] H02H *5/04*

U.S. Cl. 361—104 **19 Claims**

1. A working circuit comprising a source, means for interrupting the working circuit when the current therethrough exceeds a given level and a first heating element in series with one another, and a fail safe circuit situated in parallel with said first heating element and comprising, in series, a second heating element and a normally opened temperature responsive

switch means for connecting said second heating element in parallel with said first heating element when the temperature sensed thereby exceeds a given level whereby load current does not normally pass through said temperature responsive



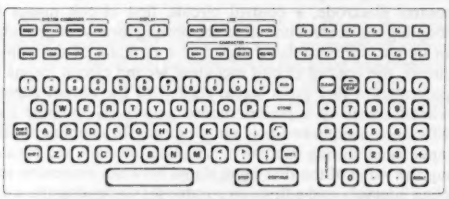
switch means and whereby, when said given temperature level is sensed by said switch means, the current in the working circuit is increased to the point where said current sensitive circuit interrupting means is actuated to open said working circuit.

4,075,679

PROGRAMMABLE CALCULATOR

Chris J. Christopher; Fred W. Wenninger; Donald E. Morris; Wayne F. Covington; Jerry B. Folsom; Joseph W. Beyers, all of Loveland; John H. Nairn, and Jeffrey C. Osborne, both of Longmont, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 8, 1975, Ser. No. 638,381
Int. Cl.[2] G06F *3/02, 9/18*
U.S. Cl. 364—200 **8 Claims**



1. An electronic calculator comprising:

memory means including a first area for storing a program of one or more lines of one or more alphanumeric statements per line and a second area for storing a single line of one or more alphanumeric statements;

keyboard input means for entering one or more lines of one or more alphanumeric statements per line into the memory means;

processing means coupled to said memory means and keyboard input means for executing lines of one or more alphanumeric statements per line; and

output display means coupled to said processing means for visually displaying alphanumeric information, including the results of execution of lines of alphanumeric statements, to the user;

said keyboard input means including a run control key for initiating execution by said processing means of a program of one or more lines of alphanumeric statements stored in said first area of said memory means; and an execute control key for initiating execution by said processing means of a single line of one or more alphanumeric statements entered from said keyboard input means and stored in said second area of said memory means;

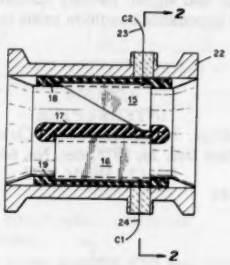
said processing means including logic means operative for enabling entry of a line of one or more alphanumeric statements from said keyboard input means during execution of a program stored in said first area of said memory means, said logic means further including means responsive to subsequent actuation of said execute control key, during execution of said program, for temporarily halting execution of said program, for initiating execution by said processing means of said entered line of one or more alphanumeric statements and for causing the results to be visually displayed on said output display means, said logic means further including means responsive to an indication by said processing means that execution of said entered line has been completed for causing said processing means to resume execution of said program.

4,075,680

CAPACITANCE DENSITOMETER FOR FLOW REGIME IDENTIFICATION

Roy L. Shipp, Jr., Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 27, 1977, Ser. No. 763,435
Int. Cl.[2] H01G *7/00*
U.S. Cl. 361—285 **2 Claims**



1. An improved two-element capacitance densitometer probe unit comprising a first insulator provided with slots on opposite sides thereof, a first triangular-shaped, ungrounded capacitor plate, a second rectangular-shaped, ungrounded capacitor one respective edge of each of said plates fitting within each of said respective slots of said insulator, a second insulator and a third insulator both provided with respective slots for receiving the other respective edges of said respective capacitor plates, a third capacitor plate and a fourth capacitor plate both adapted to be grounded, said third and fourth capacitor plates mounted on respective opposite sides of and in spaced relation to said first and second capacitor plates by means of all of said insulators and respective rivets therethrough, said probe unit adapted to be positioned into receiving grooves on the inside of a section of a flow tube and spot welded thereto, and a pair of respective output leads affixed to said respective first and second capacitor plates and adapted to extend exterior to said flow tube section through separate holes in opposite sides of said flow tube section, whereby the outputs of the respective capacitors formed by said capacitor plates can provide an indication of any one of several possible flow regimes existing in a flow tube in which said section containing said probe is mounted during the monitoring of two-phase flow through said flow tube.

4,075,681

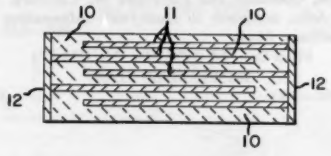
CAPACITOR WITH NOBLE METAL ELECTRODES

Michael John Popowich, Lewiston, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 576,176, June 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 406,362, Oct. 15, 1973, abandoned, which is a continuation-in-part of Ser. No. 380,602, July 19, 1973, abandoned. This application Dec. 12, 1975, Ser. No. 640,290

Int. Cl.[2] H01G *1/01*

U.S. Cl. 361—305 6 Claims



1. A multilayer capacitor of alternating layers of dielectric material and noble metal electrode material, wherein the electrode material is palladium or mixtures or alloys of at least 40% by weight palladium with one or more other noble metals selected from the class consisting of platinum, silver, and gold, plus about 0.2–14%, by weight, additive oxide, based on the total weight of additive oxide and noble metal present, wherein the additive oxide is one or more of ThO_2 and Gd_2O_3.

4,075,682

GAS-INSULATED THYRISTOR ASSEMBLY

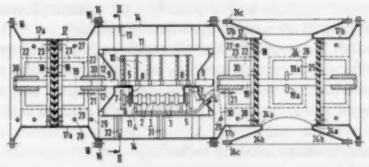
Kurt Schilling; Manfred Schraudolph; Gerd Thiele, and Jürgen Weber, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 15, 1976, Ser. No. 696,435

Claims priority, application Germany, July 4, 1975, 2530017

Int. Cl.[2] H05K *7/20*

U.S. Cl. 361—386 17 Claims



1. A gas insulated thyristor assembly comprising:

at least one thyristor column comprised of disc-type thyristors stacked in side by side relationship and of heat sinks each arranged between adjacent pairs of thyristors and serving to conduct current;

drive means and circuit component groups connected to said one thyristor column;

substantially rotationally symmetric metallic shielding means, said shielding means being disposed in surrounding relationship to said one thyristor column and to the drive means and at least a part of the circuit component groups connected to that one thyristor column;

a pressure tube surrounding said metallic shielding means and adapted to receive SF_6 gas under pressure;

first means for supporting said shielding means within said tube including insulating posts;

first and second bulkhead means for closing off the opposite ends of said pressure tube;

and first and second electrical connecting means extending in a gastight manner through said first and second bulkhead means, respectively, and providing electrical connections to said column.

4,075,683

RACK FOR CIRCUIT BOARDS

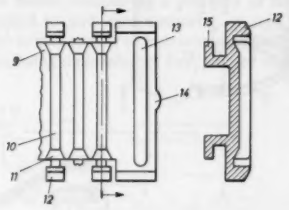
Åke Ernst Elof Johansson, Bandhagen, and Lars Christer Pahlén, Varby, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Aug. 27, 1976, Ser. No. 718,185

Claims priority, application Sweden, Sept. 5, 1975, 7509891

Int. Cl.[2] H02B *1/02*

U.S. Cl. 361—415 2 Claims



1. In a rack for the parallel arrangement of a number of circuit boards, each provided with electronic components and the associated electric wiring and a first part of a contact device, the rack including a front and a rear pair of mutually parallel profile bars attached between and perpendicular to two end plates, a corresponding number of second parts of the contact device arranged between the rear pair of profile bars and perpendicular to said pair of profile bars the improvement comprising guides mounted on each of said front profile bars for guiding the first part of a contact device towards the corresponding second part of the contact device when sliding the circuit boards into the rack, each of said guides comprising a guide moulding provided with transverse guide grooves for the circuit boards, and knobs blocking the mouth of at least some of the guide grooves, said knobs being selectively breakable to permit entry of the circuit boards into the corresponding grooves.

4,075,684

FOLDABLE LAMPSHADE

Sidney R. Witz, 420 N. Orange Drive, Los Angeles, Calif. 90036, assignor to Sidney R. Witz, Los Angeles, Calif.

Filed Oct. 20, 1976, Ser. No. 734,334

Int. Cl.[2] F21V *1/00*

U.S. Cl. 362—352 3 Claims

1. A foldable lampshade comprising, in combination:

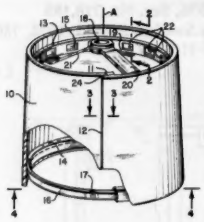
(a) flexible material capable of being rolled up into a cylindrical shape of relatively small diameter and unrolled into a relatively large cylindrical shape defining a shade with its ends in overlapping relationship;

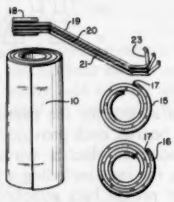
(b) upper and lower interior flexible channel means about the inside surface of said shade, said channel means lying in upper and lower parallel planes normal to the axis of said shade;

(c) upper and lower flat flexible strips arranged to be coiled into tight spirals and uncoiled into circles of diameters corresponding to the upper and lower interior diameters of said shade, respectively, and receivable in said upper and lower channel means, respectively, the ends of the flexible strips including snap means for connecting the same together to hold the upper and lower interior portions of the shade in circular shapes; and,

(d) a spider assembly including three elongated flat arm members, one above the other when in closed position, and pivoted at adjacent ends such that the arms may be scissored to an open position wherein they radially extend from the point of pivoting, the extending ends of said arms terminating in upturned portions dimensioned to cradle the upper flexible strip at circumferentially spaced points at 120° to provide a central mount for securing the shade to a lamp, said upper channel means including a series of

evenly spaced cut-out windows selected ones of which circumferentially spaced at 120° receive the extending ends of said arms making up said spider assembly whereby





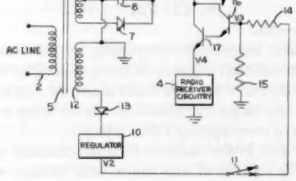
the lampshade can be disassembled and its components folded into compact configurations for storage or shipping.

4,075,685

EMITTER FOLLOWER VOLTAGE CONTROLLED POWER SUPPLY

Charles F. Fisler, New Hartford, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,909
Int. Cl.² H02M *1/12*
U.S. Cl. 363—44 **3 Claims**



1. An emitter follower voltage controlled power supply, comprising:

(a) a primary DC voltage source for generating a voltage with an inherent ripple component above a given level of voltage and having a relatively high current capacity,

(b) energy receiving circuitry,

(c) an emitter follower circuit having an input, output and control electrode for switchably connecting said primary DC voltage source to said energy receiving circuitry through said input and output electrodes, said emitter follower circuit developing a voltage drop between said control and output electrodes, during the conduction thereof,

(d) a secondary DC voltage source independent of said primary DC voltage source for generating a voltage of relatively constant voltage amplitude characteristics and having a relatively low current capacity, and

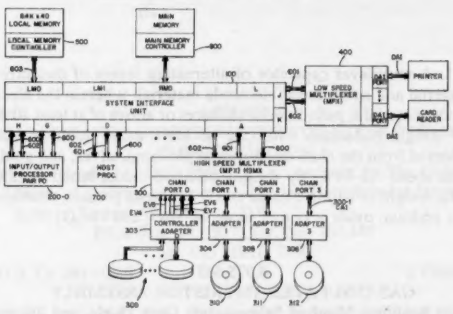
(e) circuit means for applying said secondary DC voltage source to the control electrode of said emitter follower circuit at a voltage level less than the sum of said given level and said voltage drop whereby there is applied across said receiver circuitry a voltage with the amplitude characteristics of said secondary DC voltage source and a current with the current capacity of said primary DC voltage source.

4,075,686

INPUT/OUTPUT CACHE SYSTEM INCLUDING BYPASS CAPABILITY

Jaime Calle, Glendale, and Lawrence W. Chelberg, Phoenix, both of Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 30, 1976, Ser. No. 755,871
Int. Cl.² G06F *13/00*
U.S. Cl. 364—200 **35 Claims**



1. An input/output system for controlling input/output operations involving data transfers between a plurality of modules and a plurality of input/output devices, said system comprising:

system interface means having a plurality of ports;

a plurality of modules each connected to a different one of said plurality of ports, said modules including at least one memory module and a plurality of command modules, each of said command modules including:

command generating means for generating memory commands, a first type of memory command including at least a predetermined bit coded to designate first and second categories for accessing information stored in said memory module; and,

said one memory module including:

a cache store operatively connected to one of said ports for storing blocks of information previously fetched from a backing store included in said memory module in response to certain ones of said memory commands;

said backing store operatively connected to said one of said interface ports, said backing store storing information words; and,

control circuit means connected to said cache store and to said backing store for controlling the operation of said cache store and backing store, said control circuit means including:

input register means connected to said one port for receiving said memory commands from said plurality of command modules; and,

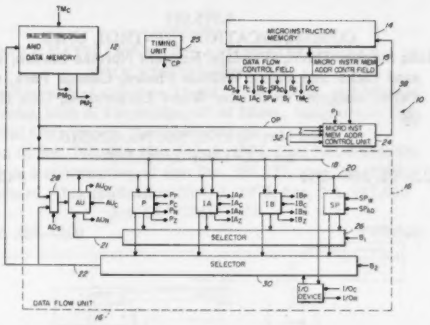
command decode circuit means connected to said input register means for decoding said commands, said decode circuit means including means which is responsive to said first type of memory command for generating control signals for enabling said backing store so as read out information specified by said first type of memory command in the absence of said accessed information being stored in said cache store and for generating control signals enabling said cache

store to write therein said accessed information which is read out from said backing store only when said predetermined bit is coded to designate said first category.

4,075,687
MICROPROGRAM CONTROLLED DIGITAL COMPUTER

Stanley M. Nissen, Reading, and Steven J. Wallach, Framingham, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Mar. 1, 1976, Ser. No. 662,303
Int. Cl.[2] G06F *9/20*
U.S. Cl. 364—200 **6 Claims**



1. A digital computer wherein a microinstruction memory stores an addressable fetch microprogram and independent sets of addressable microinstructions, each set of microinstructions including a last microinstruction for calling the fetch microprogram, and each one of the stored microinstructions in the sets thereof has an addressing control field, a microinstruction memory addressing control unit, comprising:

a. a first storage means for storing the beginning address of the fetch microprogram;

b. second storage means, responsive to a microinstruction in a first set of microinstructions under execution, for storing the address of a different microinstruction in such first set of microinstructions;

c. means for producing a control signal in accordance with a first portion of the addressing control field of one of the microinstructions in the first set of microinstructions; and

d . selector means, responsive to the control signal and a second portion of the addressing control field of the last microinstruction in a second one of the sets of microinstructions under execution, for coupling to the microinstruction memory as the next address for such memory either the beginning address of the fetch microprogram stored in the first storage means or the address of the different microinstruction in the first set of microinstructions stored in the second storage means.

4,075,688
SYSTEM FOR ADDRESSING AND ADDRESS INCREMENTING OF ARITHMETIC UNIT SEQUENCE CONTROL SYSTEM

David D. Lynch, Jr., Northridge, and Lee W. Tower, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 454,339, March 25, 1974, Pat. No. 4,025,771. This application Aug. 26, 1976, Ser. No. 718,443
Int. Cl.[2] G06F *9/20, 13/00*
U.S. Cl. 364—200 **7 Claims**

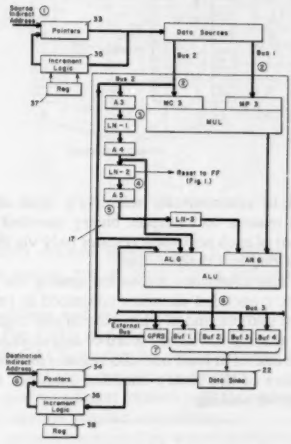
1. A processing system comprising:

a source of instructions wherein each instruction is capable of containing one or more indirect addresses or data containing one direct address;

a plurality of data memories for storng input and output data for said processing system and providing direct addresses;

processing means coupled to said source of instructions and said plurality of data memories for processing data from said plurality of data memories according to the instructions from said sources of instructions and for generating direct addresses when instructed by said source of instructions;

first pointer means comprising a plurality of first pointers each coupled to said data memories, to said processing means and to said source of instructions, said first pointers each comprising a plurality of first pointer register means



each of which stores one direct address whereby said first pointer means receives indirect addresses from said source of instructions to address one first pointer register means to fetch data from one of said plurality of data memories for said processing means; and

second pointer means comprising a plurality of second pointers each coupled to said data memories, to said processing means and to said source of instructions, said second pointers each comprising a plurality of second pointer register means each of which stoes one direct address, whereby said second pointer means receives indirect addresses from said source of instructions to address one second pointer register means to store data from said processing means in one of said memories.

4,075,689
COMPUTER EMPLOYING REDUCTION LANGUAGE

Klaus Berkling, St. Augustin, Germany, assignor to Gesellschaft fur Mathematik und Datenverarbeitung mbH Bonn, St. Augustin, Germany

Filed Feb. 13, 1976, Ser. No. 657,839
Claims priority, application Germany, Feb. 15, 1975, 2506454; June 10, 1975, 2557958
Int. Cl.[2] G06F *7/38*
U.S. Cl. 364—200 **12 Claims**

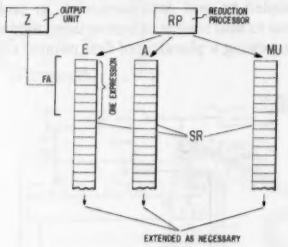
1. In a computer including a control unit, an arithmetic-logic unit, an input unit, an output unit, a signal storage unit, and a plurality of signal conducting buses, the improvement wherein:

said signal storage unit comprises at least three stack registers of arbitrary length, each said register presenting a plurality of binary word storage locations each capable of storing a binary word and the word storage locations of each said register being connected in succession to permit shifting of such words between locations;

said input unit is connected to said buses to supply a succes-

sion of binary words constituting binary encoded elements representing the atoms and constructors of a complete preorder linearized binary tree expression of a complete logic relation representing a problem to be solved, each atom representing a parameter to be operated on, each constructor defining a particular relation between two such elements, and each element being composed of at least one binary word;

each of said units is connected to communicate selectively with all of said buses, and each of said stack registers is



connected to communicate selectively with all of said buses in a manner to transport binary encoded elements into and out of each said stack register only via the storage location at one end thereof; and

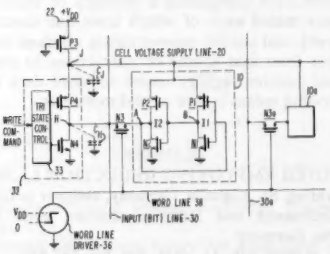
said control unit comprises means for sensing the identities of the binary encoded elements contained in the storage locations at said one end of a plurality of said registers, and means for altering the binary word of said storage location at said one end of at least one said register as a function of the identities of the binary encoded elements sensed by said means for sensing.

4,075,690

WRITE ENHANCEMENT CIRCUIT

Joel Roy Oberman, Somerville, and Roger Green Stewart, Neshanic Station, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 15, 1976, Ser. No. 667,101
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—156 **17 Claims**



1. The combination comprising:

two inverters, each inverter having an input and an output and first and second terminals for the application therebetween of an operating potential; means cross coupling the two inverters for forming a flip-flop;

a data input line;

a gating transistor connected between said data input line and a point common to the input of one inverter and the output of the other inverter;

a voltage supply terminal for the application thereto of an operating voltage;

an impedance element connected between said supply voltage terminal and said first terminals of said inverters providing a continuous conduction path therebetween when information is to be written into said flip-flop;

means for applying a reference potential to said second terminals of said inverters; and

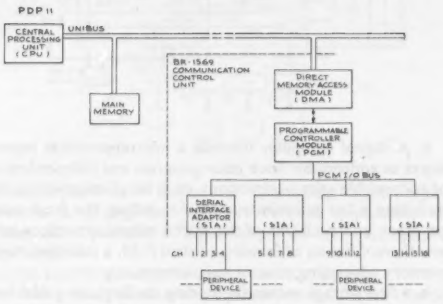
selectively enabled writing means connected between said first terminals of said inverters and said input data line for, when enabled, passing a current between said voltage terminal and said data line via said impedance element and said writing means thereby producing a potential drop across said impedance element which decreases the operating potential between said first and second terminals while simultaneously providing information of one binary significance to be written into said flip-flop onto said data input line.

4,075,691

COMMUNICATION CONTROL UNIT

John Stephen Davis, Glendale; Kenneth Norman Larson, Thousand Oaks, and Frank William Phalen, Canoga Park, all of Calif., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Nov. 6, 1975, Ser. No. 629,510
Int. Cl.[2] G06F *3/04, 5/04*
U.S. Cl. 364—200 **5 Claims**



1. In a communication control unit, useful in a data processing system having a central processing unit coupled to a main memory, and having a plurality of peripheral devices, each for communicating with said data processing system and each capable of handling messages in accordance with a different communication discipline, said communications control unit responding to messages from each peripheral device and transmitting messages to each peripheral device in accordance with the discipline defined therefor, said communication control unit comprising:

a programmable controller module including:

program memory means including a plurality of locations each storing an instruction, with sequences of instructions forming (1) control routines common to all peripheral devices and (2) character transmit/receive routines each unique to a particular communication discipline used by one or more of said peripheral devices;

instruction register means;

program address counter means for identifying a location in said program memory means and for transferring the instruction stored therein to said instruction register means;

a read/write memory means for storing data;

a data bus comprised of parallel bit lines;

means responsive to instructions transferred to said instruction register means for operating on data either in said read/write memory means or appearing on said data bus;

a direct memory access module means responsive to instructions transferred into said instruction register for transferring data from said read/write memory to said main mem-

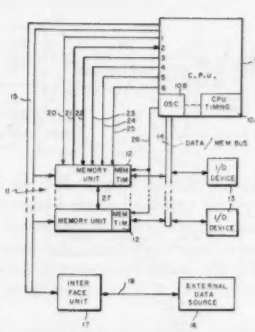
ory and from said main memory to said read/write memory; and

an interface adaptor means coupled between said programmable controller parallel data bus and said peripheral devices for receiving data from and transmitting data to said peripheral devices serial by bit.

4,075,692
DATA PATH CONFIGURATION FOR A DATA PROCESSING SYSTEM

Karsten Sorensen, Lexington; David H. Bernstein, and Michael B. Druke, both of Cambridge, all of Mass., assignors to Data General Corporation, Southboro, Mass.

Division of Ser. No. 646,351, Jan. 2, 1976, Pat. No. 4,014,006, which is a continuation of Ser. No. 387,523, Aug. 10, 1973, abandoned. This application Nov. 1, 1976, Ser. No. 737,416
Int. Cl.² G06F *7/38*
U.S. Cl. 364—200 **5 Claims**



1. A data processing system comprising

a central processor unit for processing address words and data words and at least one memory unit connected in communication with said central processor unit for storing address words and data words,

said central processor unit including

a skew protected quadriport register file having first and second read ports and first and second write ports for permitting the writing of information into said register file subsequent to the reading of information therefrom during the same processor cycle has been inserted;

an arithmetic logic unit having a first input, a second input and an output;

a parallel shifter unit having an input and an output;

said first read port of said register file connected to said first input of said arithmetic logic unit for supplying address words or data words to said arithmetic logic unit;

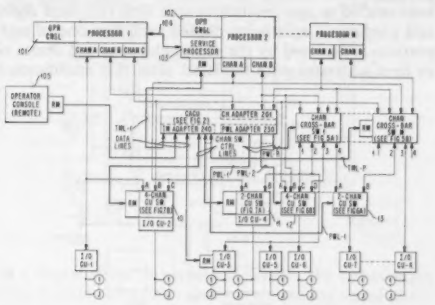
said second read port of said register file connected to said second input of said arithmetic logic unit and to said first write port of said register file for supplying address words or data words to said arithmetic logic unit or to said first write port;

the output from said arithmetic logic unit connected to the input of said shifter unit and the output of said shifter unit connected to said second write port of said register file for writing the logic unit result in parallel into the register file.

4,075,693
CONFIGURATION AND CONTROL UNIT FOR A HETEROGENEOUS MULTI-SYSTEM

Joel Lawrence Fox, Rhinebeck, and Eugene Everett Marquardt, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 646,698, Jan. 5, 1976, Pat. No. 4,014,005. This application Dec. 15, 1976, Ser. No. 750,987
Int. Cl.² G06F *3/00*
U.S. Cl. 364—200 **11 Claims**



1. A system control arrangement for obtaining selective connections among one or more CPUs and remote devices, comprising

a configuration and control unit (CACU) connected between the CPUs and the devices, the CACU having at least one CACU modem for communicating control information for at least one remote device,

a remote modem adapter located with the remote device, the remote modem adapter comprising

a remote modem connected by a time-multiplexed transmission line to the CACU modem,

a command decoder having an input connected to the output of the remote modem, a plurality of control lines providing an output of the command decoder being selectively activated in response to commands received by the command decoder from the CACU, and

a configuration register for storing a path between a selected one of the one or more processors in the system and the remote device or any I/O unit connected to the remote device, the configuration register having at least an input gate and an output gate, each of the gates having a control input connected to different ones of the control lines of the command decoder, the input gate also connected to an output of the remote modem,

whereby the output gate provides configuration signals for the remote device on a command from the CACU to the command decoder.

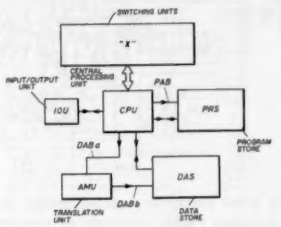
4,075,694
APPARATUS IN CONNECTION WITH A COMPUTER MEMORY FOR ENABLING TRANSPORTATION OF AN EMPTY MEMORY FIELD FROM ONE SIDE TO THE OTHER OF AN ADJACENT DATA FIELD WHILE THE COMPUTER IS OPERATIVE

Ernst Enoch Ericsson, Alta, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Oct. 4, 1976, Ser. No. 729,359
Claims priority, application Sweden, Oct. 23, 1975, 7511893
Int. Cl.² G06F *13/00*
U.S. Cl. 364—200 **3 Claims**

1. In apparatus for use in a computer system having an addressable computer memory for enabling a step by step transportation of an empty memory field containing a number of empty memory words from one side to the other of an adjacent data field containing a number of occupied memory

words, while the computer is operative, by relocating the data field in such a manner that the information stored in each successive memory word adjacent to one border of the empty memory field is transferred to an empty memory word on the other border of the empty memory field, the latter field thus dividing the data field into two field portions which share said number of occupied memory words during the transportation, an address modification unit for modifying of incoming addresses concerning a data field in the process of being relocated in order for the addresses to become related to said two field portions, each having two limit addresses, whereas having been related to one continuous area with two limit addresses, said continuous area being chosen such that one of said field portions is enclosed by the continuous area and shares one of its limit addresses with the latter area, said modification unit



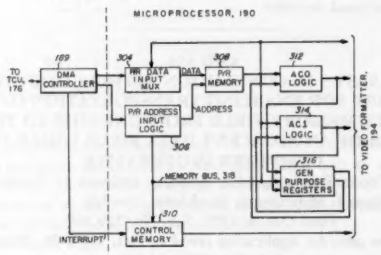
comprising comparator means for comparing said incoming addresses with that address in said empty memory field which adjoins to said one of said field portions and with a reference address which, in order to include all incoming addresses to be modified but exclude addresses relating to memory field not being concerned with said relocation, is allocated any chosen address in the address range starting with the other limit address of said continuous area and including the extreme border of the other of said field portions, and logic circuits responsive to output signals from said comparators for incrementing the incoming address by an address distance corresponding to said number of empty memory words when said output signals indicate that said incoming address falls within a range delimited by and including on the one hand said address in said empty memory field which adjoins said one of said field portions and on the other hand said reference address.

4,075,695

DISPLAY PROCESSOR SYSTEM

Helmut Lelke, Southboro, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed June 1, 1976, Ser. No. 691,955
Int. Cl.² G06F *3/14*
U.S. Cl. 364—200 **11 Claims**



1. A processor for performing predetermined operations upon digital data comprising in combination:

a plurality of accumulator means;

register means;

a permanently programmed control memory coupled to said accumulator means and said register means, said accumulator means being coupled to said register means in accordance with control signals produced as outputs of said control memory, said accumulator means and said register means performing predetermined operations upon digital data in accordance with instruction control sequences produced by said control memory, said control memory operating at least some of said accumulator means as separate from one another for predetermined ones of said operations and coupling together at least some of said accumulator means to act as a single accumulator having a larger capacity than a single one of said accumulator means for other ones of said operations; and

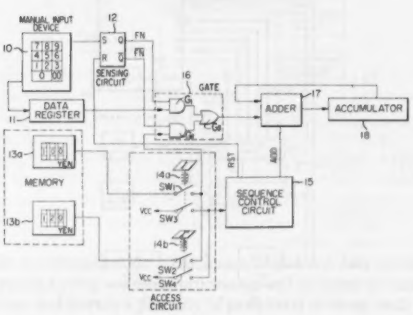
a data storage memory, said data storage memory coupling digital data to inputs of said accumulator means and instruction addresses to address inputs of said control memory.

4,075,696

DATA CONTROL DEVICE FOR SELECTIVELY PROVIDING DATA TO A PROCESSING SYSTEM

Nobuhiko Shinoda, and Tadao Kusumoto, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 586,412, June 12, 1975, abandoned.
This application Dec. 20, 1976, Ser. No. 752,171
Claims priority, application Japan, June 17, 1974, 49-68881
Int. Cl.² G06F *15/24*
U.S. Cl. 364—404 **3 Claims**



1. A data control device for selectively providing data to a processing system comprising:

an input device having numeral keys for entering first numerical data;

sensing means responsive to the operation of any one of said numeral keys for providing a predetermined output signal;

register means responsive to the operation of said numeral keys for storing the first numerical data;

memory means for storing predetermined second numerical data corresponding to selected items;

item key means operative to provide access to the second numerical data stored in said memory means;

a discriminating circuit for selecting the data to be provided to the processing system from the first numerical data stored in said register means and the second numerical data stored in said memory means in accordance with the predetermined output signal from said sensing means; and

control circuit means for applying the selected numerical data to the processing system, and for actuating said sensing means to remove said predetermined output signal therefrom, wherein when any one of said numeral keys is depressed and then any one of said item keys is depressed, the first numerical data is selected by said discriminating circuit and is provided to the processing system, and when any one of said item keys is depressed without an immediately preceding actuation of a said numerical key, the

second numerical data is selected by said discriminating circuit and is provided to the processing system.

4,075,697

APPARATUS FOR MONITORING TWO ELECTRIC QUANTITIES BY COMBINING THREE CONSECUTIVE SAMPLES OF EACH QUANTITY

Tomoyoshi Ochiai; Takeshi Hayashi, and Mituhiro Furuse, all of Tokyo, Japan, assignors to Tokyo Denryoku Kabushiki Kaisha and Kabushiki Kaisha Meidensha, both of Tokyo, Japan

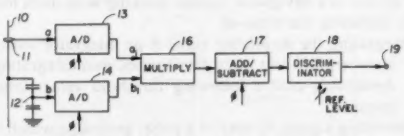
Continuation of Ser. No. 508,629, Sept. 23, 1974, Pat. No. 4,006,348. This application Oct. 21, 1976, Ser. No. 734,539

Claims priority, application Japan, Oct. 1, 1973, 48-110856; Oct. 1, 1973, 48-110857

The portion of the term of this patent subsequent to Feb. 1, 1994, has been disclaimed.

Int. Cl.[2] G06F *15/20;* **G01R** *13/02*

U.S. Cl. 364—481 **4 Claims**



1. Apparatus for monitoring a variable derived from a first substantially sinusoidal electric quantity having a first period and a second substantially sinusoidal electric quantity having a second period nominally substantially equal to said first period, said variable being independent of time, comprising:

a source of sampling pulses of a predetermined sampling period;

two samplers responsive to said sampling pulses and respectively responsive to said first and second electric quantities for respectively deriving first and second discrete signals from said first and second electric quantities at individual sampling points defined by said sampling pulses, said first and second discrete signals being representative of samples of said first and second electric quantities, respectively;

at least one multiplier unit coupled to said samplers for calculating at least one product of samples which are representative of at least one pair of said discrete signals to produce at least one product signal representative of said product, one and the other of said at least one pair being derived from said first and second electric quantities; respectively:

arithmetic means coupled to said multiplier unit for carrying out at least an algebraic addition of a signal representative of at least one of the product signals produced by said at least one multiplier unit with another signal in response to the discrete signals derived at three consecutive ones of said sampling points to produce a first result signal representative of said variable, said variable being further independent of phase relations between said sampling pulses and respective ones of said electric quantities; and

a discriminator circuit coupled to said arithmetic means and responsive to said first result signal for producing a second result signal when said variable exceeds a given reference value.

4,075,698

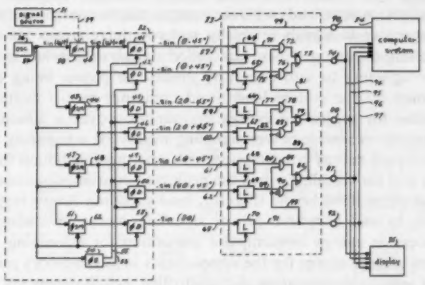
DIGITAL PHASE MEASUREMENT SYSTEM

Tenny D. Lode, 3270 Cherryridge Road, Englewood, Colo. 80110

Continuation of Ser. No. 456,853, April 1, 1974, abandoned. This application May 28, 1976, Ser. No. 690,869

Int. Cl.[2] H03K *13/02;* **G01R** *25/00*

U.S. Cl. 364—483 **32 Claims**



1. In a digital phase measurement system, the combination including a source of a first reference alternating signal establishing a reference phase, a source of a second alternating signal of substantially the same frequency of the reference signal whose phase is to be measured relative to the phase of said reference signal, means responsive to said first and second alternating signals generating a set of additional alternating signals each in a substantially predetermined phase relationship to predetermined multiples, differing from one, of the phase differences of said second alternating signal relative to the phase of said first alternating signal, means generating a set of a plurality of logical signals whose values are predetermined functions of said first, second and additional alternating signals respectively, means to provide a plurality of first subsets of logical signals, with each first subset comprising a plurality of said logical signals, and with each of said first subsets of logical signals corresponding to the relative phase of a single one of said alternating signals, means to control said means to provide, and means for connecting said logical signals to digital data responsive means.

4,075,699

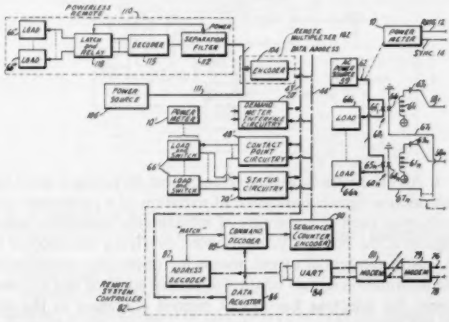
POWER MONITORING AND LOAD SHEDDING SYSTEM

Richard A. Schneider, Edison, N.Y.; Gerald L. Freed, Highland Park, and Richard Lipnick, Scotch Plains, both of N.J., assignors to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed June 24, 1976, Ser. No. 699,571

Int. Cl.[2] G01R *21/00;* **G05B** *15/02*

U.S. Cl. 364—492 **16 Claims**



1. In combination in a power load shedding system for con-

trolling the operative status of plural controllable system loads each selectively connectable to a source of energy, comprising stored program controlled digital computer means including a central processing unit and memory means communicating with said central processing means, said memory means including data storage means for each load for storing the characteristics and status of the associated load, plural controlled switch means for selectively connecting and disconnecting the controllable system loads with the energy source, control circuitry responsive to signals issued by said computer means for controlling the status of said controlled switch means, and means for signaling to said computer means the power being consumed by the system loads, said computer means including means for projecting energy consumption over a measuring interval, excessive power signaling means for comparing said projected energy consumption with a permissible bound therefor and for signaling when the projected consumption exceeds said permissible bound therefor, load shedding means responsive to said excessive power signaling means indicating an excessive energy consumption projection for examining said data storage means for the system loads in said memory means for selectively operating said controlled switch means via said control circuitry to operatively disconnect selected system loads from the energy source, wherein said control circuitry comprises a register having plural stages each signaling the desired relative operative condition for a different system load, and plural relays each responsive to the output of an associated register stage for controlling the state of an associated one of said plural controlled switch means, further comprising plural multi-position switches including a first pole serially included between said register and one of said controlled switch means associated therewith, further comprising status circuitry for supplying information to said central processing unit, said status circuitry including an additional register having a first plurality of stages, wherein each of said multi-position switches of said control circuitry includes an additional pole connected to a different stage to said additional register

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4,075,700

INFORMATION DISPLAY ARRANGEMENTS

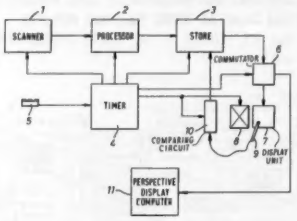
Alan George Blay, Kenley, England, assignor to EMI Limited, Hayes, England

Filed July 6, 1976, Ser. No. 703,004

Claims priority, application United Kingdom, July 4, 1975, 28219/75

Int. Cl.[2] G01T *1/16;* **G08C** *21/00*

U.S. Cl. 364—515 **5 Claims**



1. An information display arrangement including a store for information signals indicative of variation of a parameter of a body over each of a plurality of substantially two-dimensional regions in the body, adjacent regions overlying one another to at least a substantial extent, means for displaying individually the information signals relating to at least some of said regions, means for selecting features of interest contained in the displayed information, and means for combining the information so displayed to provide a pseudo three-dimensional display of part of said body with the selected features shown in relief.

4,075,701

METHOD AND CIRCUIT ARRANGEMENT FOR ADAPTING THE MEASURING RANGE OF A MEASURING DEVICE OPERATING WITH DELTA MODULATION IN A NAVIGATION SYSTEM

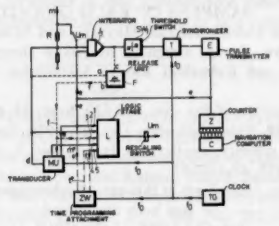
Fritz Hofmann, Munich, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Germany

Filed Feb. 3, 1976, Ser. No. 654,960

Claims priority, application Germany, Feb. 12, 1975, 2505838; Jan. 23, 1976, 2602496

Int. Cl.[2] G01C *21/16;* **G06F** *15/50;* **G01R** *15/08*

U.S. Cl. 364—579 **4 Claims**



4. A method for adapting the measuring range of a measuring device in a navigation system working with delta modulation, including the steps of:

integrating the measuring value in an integrator switchable between different input sensitivities, said integrating step continuing until a following threshold value switch responds;

providing a pulse by way of a pulse, generator which serves to reset the integrator by one pulse weight, and which is stored at the same time in a counter at the input of a navigational computer;

controlling the release time of the pulse generator by a synchronizer so that the pulse is timed according to the remaining periphery of the navigational computer;

controlling the switching between different input sensitivities of the integrator to take place only when a small signal appears at the output of the integrator and when switching is necessary because of the size of the data signal, the release time of the pulse generator serving as a switching criterion;

correcting the zeroing error of the measuring instrument by switching the input of the integrator to a measuring range with reversible measuring direction and different switchable input sensitivities; and

providing a second equivalent measuring instrument for supplying data signals during the reversal of the measuring direction, the measuring direction being reversed only when a small signal appears at the output of the integrator.

4,075,702

ELECTRONIC CALCULATING APPARATUS AND WALLET ENCLOSURE

David C. Davies, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

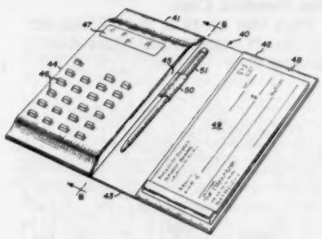
Filed Mar. 12, 1976, Ser. No. 666,362

Int. Cl.[2] G06F *15/02*

U.S. Cl. 364—705 **16 Claims**

1. In a battery-operated, portable electronic calculating apparatus having means for inserting numbers, computing means, means for displaying the results of insertions and computations, and battery containing means for powering said apparatus, the improvement comprising means forming an

elongated battery compartment having a location extending along one side of said apparatus parallel to the longitudinal axis



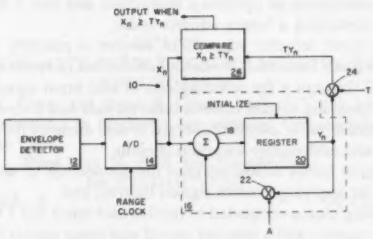
thereof for receiving an elongated battery means to operate said apparatus.

4,075,703

RECURSIVE FILTER MEAN-LEVEL DETECTOR

George M. Dillard, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 1, 1976, Ser. No. 737,877
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—715 **6 Claims**



1. A device for calculating the mean level of a stochastic process and for using the mean level to provide a threshold for determining the presence or absence of a signal comprising:

first means for outputting sample values X_n of a detected signal;

a first order recursive filter connected to the output of said first means for providing output values Y_n proportional to the mean value of said stochastic process;

second means connected to said first order recursive filter for forming the products TY_n where T is a predetermined value; and

third means for comparing the values TY_n with said values X_n and for providing an output when $X_n \geqq TY_n$.

4,075,704

FLOATING POINT DATA PROCESSOR FOR HIGH SPEECH OPERATION

George P. O'Leary, Beaverton, Oreg., assignor to Floating Point Systems, Inc., Portland, Oreg.

Filed July 2, 1976, Ser. No. 702,148
Int. Cl.[2] G06F *7/38*
U.S. Cl. 364—748 **11 Claims**

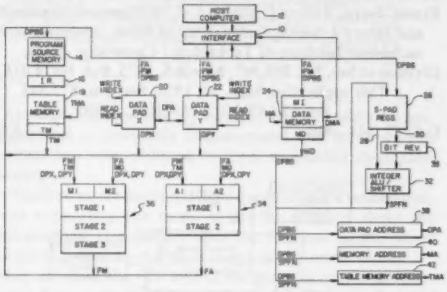
1. A floating point data processor comprising:

a plurality of memory register means, said memory register means having inputs and outputs,

a floating point adder means for receiving a pair of inputs and performing arithmetic operations on said inputs, said adder means including a mantissa portion and an exponent portion,

a floating point multiplier means for receiving a pair of inputs for multiplication, said multiplier means including a mantissa portion and an exponent portion,

and a plurality of separate, simultaneously operable bus means including first bus means coupled to said adder means for receiving the ouput of said adder means while also being coupled to the said memory register means, multiplier means, and adder means for providing the output of said adder means as selectable input to the said memory register means, multiplier means and adder means, second bus means coupled to said multiplier means for receiving the output of said multiplier means while also being coupled to the said memory register means,



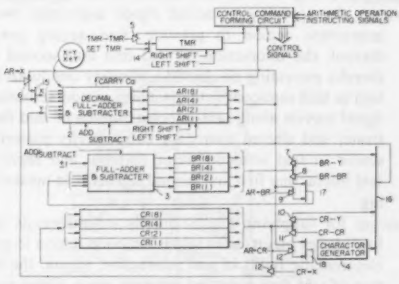
multiplier means and adder means for providing the output of said multiplier means as selectable input to the said memory register means, multiplier means and adder means, third bus means coupled to said adder means for providing input to said adder means while also being coupled to said memory register means for receiving output from said memory register means as selectable input to said third bus means, and fourth bus means coupled to said multiplier means for providing input to said multiplier means while also being coupled to said memory register means for receiving output from said memory register means as selectable input to said fourth bus means.

4,075,705

CALCULATOR FOR DETERMINING CUBIC ROOTS

Yoichi Kawabata, and Minoru Machida, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1975, Ser. No. 640,845
Claims priority, application Japan, Dec. 16, 1974, 49-144741
Int. Cl.[2] G06F *7/48*
U.S. Cl. 364—752 **5 Claims**



1. A calculator comprising:

numerical keys for entering numerical data into said calculator;

a cubic root key for actuation to enter an instruction signal operative to extract a cubic root;

storage means coupled to said numerical keys for storing the data entered by said numerical keys; and

processing circuit means coupled to said cubic root key and

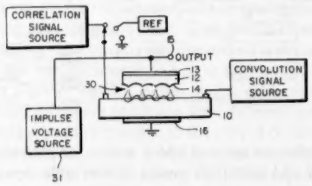
said storage means and operative in response to said cubic root instruction signal for developing the cubic root of the data in said storage means, wherein said processing circuit means comprises means for processing the data stored in said storage means as sets of data, wherein each set includes three successive digits of the data in the storage means, and for performing numerical operations on each of the respective sets.

4,075,706

SURFACE WAVE DEVICES FOR PROCESSING SIGNALS

Ernest Stern, Concord; Richard C. Williamson, Framingham, and Henry I. Smith, Sudbury, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 555,367, March 5, 1975, Pat. No. 4,016,412.
This application Mar. 31, 1976, Ser. No. 672,344
Int. Cl.[2] G06G *7/19*; G11C *27/00*
U.S. Cl. 364—821 **7 Claims**



1. A device for processing and storing signals comprising

a first piezoelectric substrate capable of propagating acoustic wave signals on a selected surface thereof;

at least one transducer means formed on said selected surface for generating a surface acoustic wave traveling on said surface along a selected direction thereof in response to an electrical signal;

a semiconductor material positioned so as to have a first surface thereof adjacent and spaced from said selected surface of said first substrate to form an interaction region which includes the region at or near said surfaces and the spatial region therebetween;

a layer of conductive material disposed on a second surface of said semiconductor material, said layer forming an electrode;

means for providing a first signal at said at least one transducer means to produce a first traveling acoustic wave signal along said selected surface of said first substrate;

means for applying a second signal uniformly over said interaction region to provide time-varying properties thereof, the interaction of said first and second signals thereby providing an altered stationary conductivity pattern in said semiconductor material as said acoustic wave signal travels along said selected surface of said first substrate, said altered stationary conductivity pattern being stored in said semiconductor material and representing said interacting first and second signals, said means including

means for supplying a substantially instantaneous burst of low energy electrons in said interaction region to establish electrostatic fields in said interaction region, the interaction of said first traveling acoustic wave signal with said low energy electrons thereby providing said altered stationary conductivity pattern; and wherein said low energy electron supplying means comprises

an array of field emitting devices positioned on said first surface of said semiconductor material, and

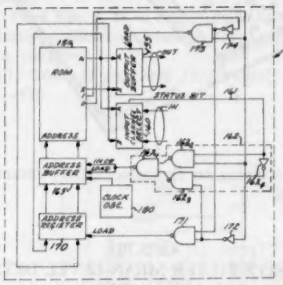
means for activating said field emitting devices to produce a plurality of electrons in said interaction region to form said electrostatic fields.

4,075,707

PROGRAMMED DEVICE CONTROLLER

Michael E. Wilmer, Portola Valley, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 21, 1976, Ser. No. 688,653
Int. Cl.[2] G05B *11/01*; G06F *9/00*
U.S. Cl. 364—900 **12 Claims**



1. A programmable controller adapted to control an automated device, comprising:

a programmable memory adapted to store a plurality of binary words at corresponding addressable locations therein, each word comprising binary bits, bit 0 and 1 containing an operating instruction and bits 2 through *n* containing a binary address code;

an input selector adapted to receive a plurality of input signals from said device and connected to receive said bits 2 through *n* for selecting one of said input signals corresponding to said address code on said bits 2 through *n*;

address buffer means connected to said memory for selecting said addressable locations therein;

output buffer means adapted for connection to said device for applying control signals thereto; and

gating means connected to receive said bits 0 and 1 from said memory and a selected one of said input signals from said selector for applying said bits 2 through *n* to said address or output buffer when said bit 0 is of a first polarity according to the polarity of said bit 1 and for applying said bits 2 through *n* to said selector when said bit 0 is of a second polarity and loading or incrementing said address buffer means according to the relationship of the polarity of said selected one of said input signals with said bit 1.

4,075,708

LARGE CAPACITY MAJOR-MINOR LOOP BUBBLE DOMAIN MEMORY WITH REDUNDANCY

Thomas T. Chen, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 24, 1976, Ser. No. 689,312
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—2 **9 Claims**

1. A large capacity memory comprising

a plurality of substantially similar modules,

interconnecting means at the edges of each module for interconnecting the modules,

said interconnecting means having sufficient size to permit reasonable tolerance in alignment thereof while permitting interconnection of the modules,

each of said modules including:

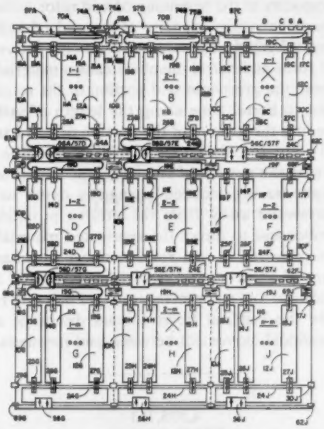
a primary major loop,

a secondary major loop,

at least one minor loop coupled to said primary major loop and to said secondary major loop to permit the selective interchange of information between the respective loops, and

junction means connected between said primary major loop

and said secondary major loop and at least some of said interconnecting means to permit the selective interchange



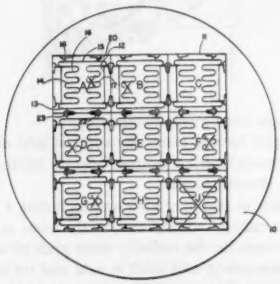
of information between the associated major loops of adjacent interconnected modules.

4,075,709

LARGE CAPACITY BUBBLE DOMAIN MEMORY WITH REDUNDANCY

Thomas T. Chen, and Isoris S. Gergis, both of Yorba Linda, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 24, 1976, Ser. No. 689,313
Int. Cl.² G11C *19/08*
U.S. Cl. 365—2 **11 Claims**



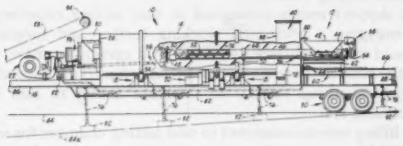
1. A large capacity memory comprising:
a plurality of substantially similar modules arranged in an array,
interconnecting means in each module for interconnecting the adjacent modules in said array,
said interconnecting means having sufficient size to permit reasonable tolerance in alignment thereof while permitting actual interconnection of the adjacent modules,
each of said modules including a plurality of propagation paths arranged substantially in parallel to each other in a functional manner,
passive junction means connected to the ends of certain propagation paths and to said interconnecting means,
said junction means is selectively alterable to establish the connection between respective paths in said module whereby the propagation paths in all of said modules are connected together in series.

4,075,710

APPARATUS FOR PRODUCING HOT MIX ASPHALT UTILIZING RECYCLABLE ASPHALT AGGREGATE

Herbert E. Jakob, Taylors, S.C., and David L. Garbelman, Edmond, Okla., assignors to CMI Corporation, Oklahoma City, Okla.

Filed Mar. 7, 1977, Ser. No. 775,388
Int. Cl.² B28C *1/22, 5/06*
U.S. Cl. 366—25 **9 Claims**



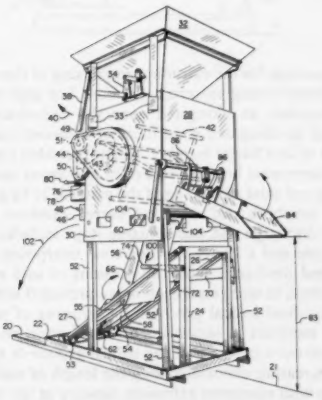
1. Apparatus for producing hot mix asphalt utilizing new aggregate and a previously manufactured and layed asphalt mix which has been reduced to form recyclable aggregate, comprising:
a cylindrical mixer drum having a first end and a second end;
means supporting the mixer drum for rotation about the longitudinal axis thereof with the first end of the mixer drum higher than the second end of the mixer drum;
burner means at the first end of the mixer drum for producing a flame in the mixer drum extending from the first end of the mixer drum to a medial portion of the mixer drum;
recyclable aggregate conveyor means extending from the second end of the mixer drum to a medial portion of the mixer drum for feeding the recyclable aggregate into a medial portion of the mixer drum;
means for feeding the new aggregate into the first end of the mixer drum;
means for injecting asphaltic oil into the mixer drum;
flights in the mixer drum for moving the new aggregate and recyclable aggregate around the mixer drum and mixing the asphaltic oil, new aggregate and recyclable aggregate within the mixer drum to form a hot mix asphalt; and
means for discharging the hot mix asphalt from the second end of the mixer drum.

4,075,711

CONCRETE MIXING SYSTEM

Jack F. Hall, Portland, Oreg., assignor to U-Cart Concrete Systems, Inc., Vancouver, Wash.

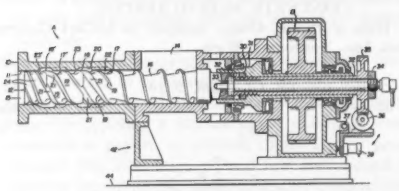
Filed Dec. 9, 1976, Ser. No. 749,042
Int. Cl.² B28C *5/14*
U.S. Cl. 366—26 **4 Claims**



1. An apparatus for mixing concrete, comprising:

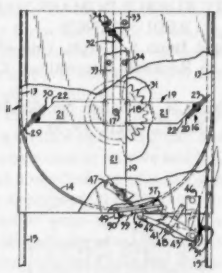
(a) an upright mixing chamber having a top and bottom;
(b) inlet means, having a top, attached to said mixing chamber for permitting the introduction of concrete mix materials into said mixing chamber;
(c) mixing means within said mixing chamber for blendingly combining said mix materials with one another so as to form a concrete mixture in said mixing chamber;
(d) outlet means proximate the bottom of said mixing chamber for selectively discharging said concrete mixture from said mixing chamber;
(e) support means connected to said mixing chamber for engaging a horizontal working surface and supporting said mixing chamber in a lowered upright position with the bottom thereof at a first predetermined distance above said working surface to facilitate access to said inlet means; and
(f) lifting means connected to said mixing chamber for selectively raising said mixing chamber to a raised upright position, with the bottom thereof at a second predetermined distance above said working surface greater than said first predetermined distance, so as to provide sufficient clearance between the bottom of said mixing chamber and said working surface to permit movement of a concrete mixture transport device to a position on said working surface beneath said outlet means, said lifting means comprising a plurality of members movable with respect to one another in such a manner that such plurality of members push upwardly against said mixing chamber during such movement, means for energizing said members, and means for continuously maintaining said upright mixing chamber in upright orientation during said lifting and said discharging.

4,075,712
EXTRUSION AND MIXING APPARATUS
Paul Geyer, 15660 Tacoma Ave., Detroit, Wayne County, Mich. 48205
Continuation-in-part of Ser. No. 712,450, Aug. 8, 1976, abandoned, which is a continuation of Ser. No. 565,453, April 7, 1975, abandoned. This application Dec. 22, 1976, Ser. No. 753,595
Int. Cl.[2] B29B *1/06*
U.S. Cl. 366—79 **32 Claims**



1. An apparatus for the extruding and mixing of thermo-plastic and thermo-setting materials for both hot and cold feed which comprises: an elongated generally cylindrical barrel member and an elongated rotor member disposed coaxially in the interior of said barrel member; means provided for relative rotational movement between said rotor and barrel members in the treating and axial advancing of the material to be processed along said members; said rotor and barrel members having a feed end, a discharge end, and a mixing stage including a rotor to barrel zone and a barrel to rotor zone interposed between said feed and discharge ends; the portions of said rotor and barrel members in said zones each being provided with one or more longitudinal helical grooves; the grooves of said rotor and barrel members in said rotor to barrel zone being sized, with the extrusion capacity of the helical groove in said rotor member decreasing uniformly along the length of said rotor to barrel zone with maximum extrusion capacity at the beginning of said rotor to barrel zone and minimum extrusion capacity of helical groove in said barrel member increasing uniformly along the length of said rotor to barrel zone with minimum extrusion capacity at the beginning of said rotor to barrel zone and maximum extrusion capacity at the end of said rotor to barrel zone, whereby said relative rotational movement between said rotor and barrel members causes materials to flow outward from the groove in said portion of the rotor member in said rotor to barrel zone along the length of said rotor to barrel zone into the groove of the portion of said barrel member in said rotor to barrel zone which receives the material; said grooves in the portion of said barrel member in said barrel to rotor zone having reduced change in depth to turn the material presented away from the groove provided in said barrel member and to direct the reoriented material towards the groove provided in said rotor member for changing the axis of material shear as said material is advanced from said barrel member to said rotor member in said barrel to rotor zone from where the material flows to said discharge end upon relative rotational movement between said members.

4,075,713
FEED MIXER
Harlan J. Easton, R.F.D. 3, Blooming Prairie, Minn. 55917
Filed Nov. 11, 1976, Ser. No. 741,159
Int. Cl.[2] B01F *7/04*
U.S. Cl. 366—192 **4 Claims**



1. A granular feed mixer comprising:
a. a container having generally vertical side and end walls, and a semi-cylindrical bottom portion having a discharge opening therethrough;
b. an agitator in said container and including a central shaft, arms extending radially outwardly from said shaft, and mixing vanes on the radially outer ends of said arms;
c. means journaling said shaft in said end walls for rotation generally on the axis of the radius of said bottom portion;
d. drive means for imparting rotation to said agitator, to mix and blend material in said container;
e. and closure means for said discharge opening and including, a plate-like closure member having opposite ends, guide means mounting said closure member for movements toward and away from a closed position underlying said discharge opening, closure member moving means having an end portion connected to one end of said closure member in angularly spaced relation thereto for imparting opening and closing movements thereto, and cam means on said bottom portion engaging the outer end of said closure member and cooperating with said closure member moving means end portion to exert sealing pressure to said closure member against said bottom portion responsive to movement of said closure member to its closed position.

DESIGN PATENTS

GRANTED FEBRUARY 21, 1978

ERRATA

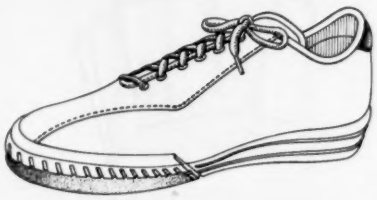
For CLASS	See PATENT NO.
D22–028	247,304

DESIGNS

FEBRUARY 21, 1978

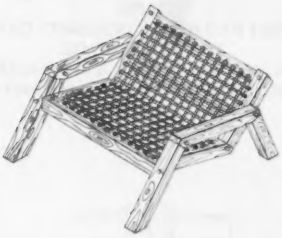
247,266
HAT HAVING AIR CHAMBER
Yutaka Yoshida, 1941-8, Manazuru, Manazurucho, Ashigarashimo, Kanagawa, Japan
Filed Aug. 11, 1976, Ser. No. 713,422
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—230

247,267
SHOE
Dennis P. Dolinsky, Naugatuck, Conn., assignor to Uniroyal, Inc.
Filed June 3, 1976, Ser. No. 692,612
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310



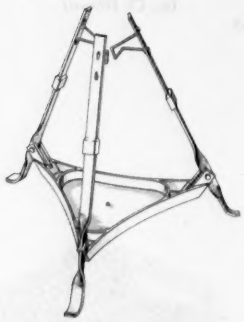
247,268
KEY-KEEPER
Michel Quenot, Rue Grenier, France, assignor to Stanley-Mabo, Besancon, France
Filed Dec. 30, 1975, Ser. No. 645,359
Claims priority, application France, July 4, 1975, 1,091
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400

247,269
SETTEE
Larry L. Hughes, 2923 Winter St., Fort Wayne, Ind. 46806; Don E. Lutz, 9314 Kress Road, Fort Wayne, Ind. 46809, and Mark A. Hade, R.R. No. 1, Grabill, Ind. 46741
Filed Feb. 27, 1976, Ser. No. 661,939
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



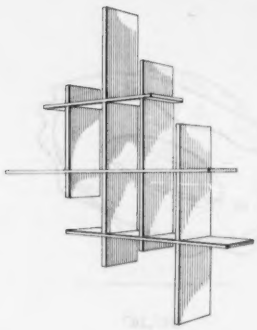
247,270
STAND FOR TRANSPORTING AND PERMITTING WORK ON MOTORS
George Allan Barnes, 5220 NE. 45th Terrace, Kansas City, Mo. 64117
Filed Oct. 24, 1975, Ser. No. 625,463
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85

247,271
HOLDER FOR CHRISTMAS TREE OR POTTED PLANTS
Albert E. Zipser, P.O. Box 778, Ceres, Calif. 95307
Filed Mar. 3, 1976, Ser. No. 663,348
Term of patent 14 years
Int. Cl. D6—*99, 06*
U.S. Cl. D6—105

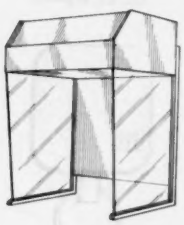


247,272
STORAGE PANEL FOR SKI BOOTS OR THE LIKE
Bernard J. Putt, Star Route Box 169, Howard, Colo. 81233, and Roger E. Hughet, 5635 Putnam, West Bloomfield, Mich. 48033
Filed Jan. 28, 1976, Ser. No. 652,977
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—130

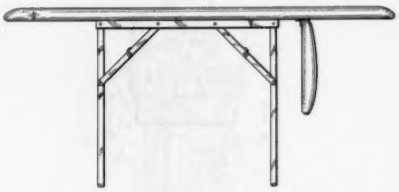
247,273
SHELF UNIT
Robert Peters, Ville St. Laurent, Canada, assignor to Swen Decorative Products Limited - Produits Decoratifs Swen Limitee, Montreal, Canada
Filed Aug. 6, 1976, Ser. No. 712,366
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—135



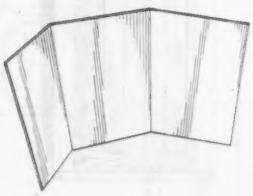
247,274
CABINET
Bryan McKinnon, St. Laurent, Canada, assignor to Robert A. Elder, Chateauguay-Centre, Canada
Filed Sept. 25, 1975, Ser. No. 616,896
Claims priority, application Canada, July 30, 1975, 25-04-75-1
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—172



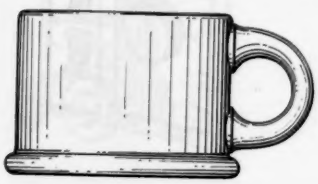
247,275
BEAUTY TREATMENT OPERATORY TABLE
Joseph Colombo, Whitestone, N.Y., assignor to Keron Laboratories Ltd., College Point, N.Y.
Filed July 1, 1976, Ser. No. 701,928
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



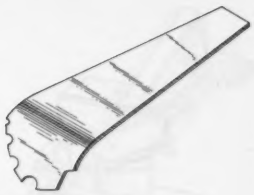
247,276
EASEL OR SIMILAR ARTICLE
Donald B. Smith, R.R. No. 1, Mount Brydges, Ontario, Canada (N0L 1W0)
Filed Apr. 28, 1975, Ser. No. 572,409
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—184



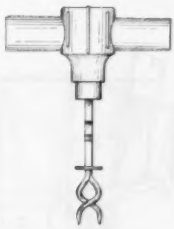
247,277
CUP
Niels Refsgaard Andersen, Rude, Denmark, assignor to Dansk International Designs Ltd., Mount Kisco, N.Y.
Filed June 23, 1976, Ser. No. 698,981
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—9



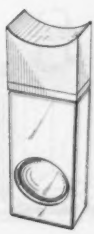
247,278
BLADE FOR A BARBECUE GRILL SCRAPER
Richard W. Dunn, Jr., 328 Belvedere SE., Warren, Ohio 44483
Filed Sept. 29, 1976, Ser. No. 727,971
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—181



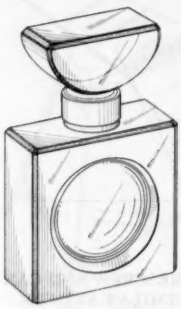
247,279
COMBINED CORKSCREW AND CAN OPENER OR SIMILAR ARTICLE
Robert K. Marceca, 246 E. 58th St., New York, N.Y. 10022
Filed June 18, 1976, Ser. No. 697,326
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D8—42



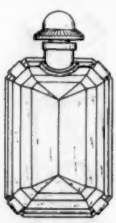
247,280
BOTTLE OR SIMILAR ARTICLE
Adam J. Grodin, Forest Hills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Filed Mar. 1, 1976, Ser. No. 662,297
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—71



247,281
BOTTLE OR SIMILAR ARTICLE
Adam J. Grodin, Forest Hills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Filed Mar. 1, 1976, Ser. No. 662,299
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—71



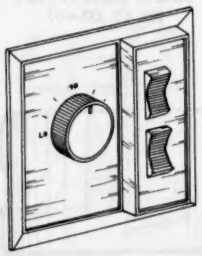
247,282
BOTTLE
Jacques Zimmermann, Saint-Cloud, France, assignor to Les Must de Cartier-France, Paris, France
Filed Mar. 22, 1976, Ser. No. 668,817
Claims priority, application France, Sept. 24, 1975, 74.185
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—71



247,283
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc.
Division of Ser. No. 467,079, May 6, 1974. This application Sept. 29, 1975, Ser. No. 617,352
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—157

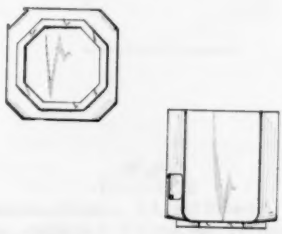
247,284
CLOCK
Rodney T. Huddleston, Box 409, Lead, S. Dak. 57754
Filed Apr. 5, 1976, Ser. No. 673,678
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—11

247,285
THERMOSTAT
Herbert J. Taylor, Aloha, Oreg., assignor to Sunne Controls Division Peco, Inc., Portland, Oreg.
Filed Apr. 12, 1976, Ser. No. 676,209
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—50

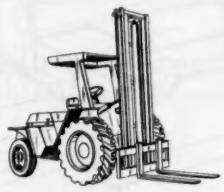


247,286
PLAQUE
Betty M. Mathie, 2958 E. Lake Merry Drive, Salt Lake City, Utah 84121
Filed June 16, 1975, Ser. No. 587,249
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—134

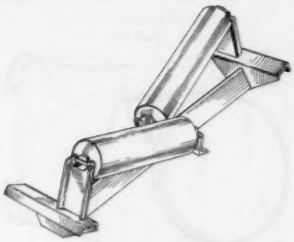
247,287
FLOWER POT
Raymond E. Grosfillex, Arbent, France, assignor to Grosfillex S.A.R.L., Arbent, France
Filed Apr. 7, 1977, Ser. No. 785,551
Claims priority, application France, Oct. 7, 1976, 76 2672
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—155



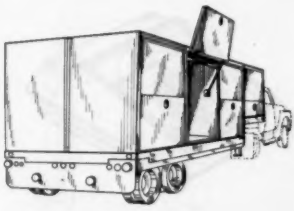
247,288
LIFT TRUCK
John W. Haswell, Belleville, Mich., assignor to Master Craft Engineering, Inc., Belleville, Mich.
Filed Apr. 2, 1976, Ser. No. 672,433
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—57



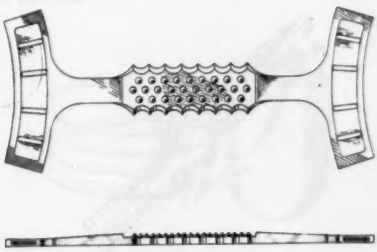
247,289
BELT CONVEYOR IDLER
Edward J. Christiansen, Beaverton, Oreg., assignor to Barber-Greene Company, Aurora, Ill.
Filed May 17, 1976, Ser. No. 687,238
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—60



247,290
TRAILER
Leland D. Arnot, Jr.; Ray C. Imel, Jr., and Donald E. Imel, all of Boulder, Colo., assignors to Wano Company, Inc., Lafayette, Colo.
Filed Dec. 8, 1975, Ser. No. 638,903
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—97

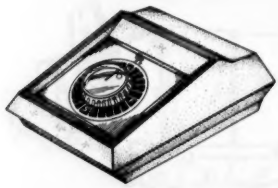


247,291
TRANSVERSE TRACTION TREAD FOR VEHICLE TIRES
Harry M. Gilmartin, Bellevue, Wash., assignor to Polytech Industries Inc., Woodenville, Wash.
Filed Aug. 12, 1976, Ser. No. 713,847
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—154

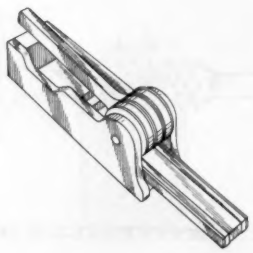


247,292
MIRROR FOR BICYCLE HANDLEBAR
George Malcolm Brown, R.F.D. No. 2, Box 144, Canterbury, Conn. 06331
Filed July 30, 1976, Ser. No. 710,334
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—189

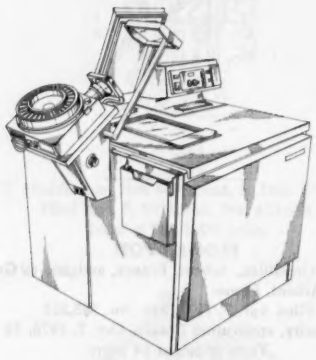
247,293
ANTENNA ROTATOR CONTROL
David D. Tompkins, Columbus, Ohio, assignor to Crown Controls Corporation
Filed Feb. 25, 1976, Ser. No. 661,320
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32



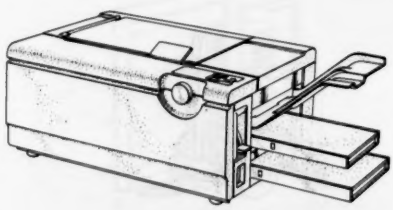
247,294
CAN CRUSHER
Andre L. Grable, 3020 Abilene St., Aurora, Colo. 80011
Filed May 7, 1976, Ser. No. 684,182
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—123



247,295
MULTICOLOR TRANSPARENCY REPRODUCTION MACHINE
Abraham Cherian, Webster, and Ruedigar W. Knodt, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Mar. 3, 1976, Ser. No. 663,387
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—27

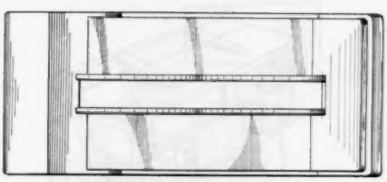


247,296
ELECTROSTATIC COPIER
Kenichi Nakade, Yokohama, Japan, assignor to Ricoh Co., Ltd., Japan
Filed Sept. 7, 1976, Ser. No. 720,796
Claims priority, application Japan, Mar. 18, 1976, 51-9536
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31

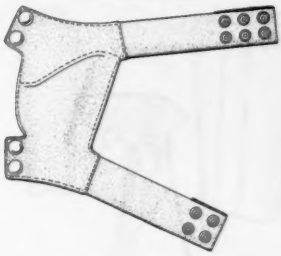


247,297
ADJUSTABLE SUPPORT-TYPE HOLDER FOR BINOCULARS
Neil D. Adams, St. Genevieve, Mo., assignor to Adco Products, Inc.
Filed Jan. 9, 1976, Ser. No. 647,894
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—50

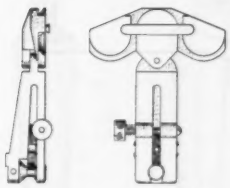
247,298
CARD FILE
Joseph P. Maruca, Coventry, R.I., and Robert A. Chieda, Westport, Conn., assignors to Textron, Inc., Providence, R.I.
Continuation of Ser. No. 392,358, Aug. 28, 1973. This application Oct. 8, 1975, Ser. No. 620,857
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76



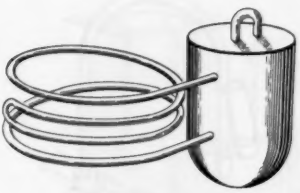
247,299
LEG HOLSTER
John E. Bianchi, and Richard D. E. Nichols, both of Fallbrook, Calif., assignors to Bianchi Leather Products, Inc., Temecula, Calif.
Filed June 21, 1976, Ser. No. 698,031
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13



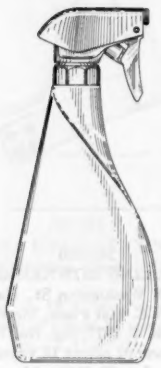
247,300
TROLLING DOWNRIGGER
Jerry G. Dusich, 4898 Washington St., Gary, Ind. 46408, and Willard Basco, 1009 E. 61st Place, Merrillville, Ind. 46410
Filed Feb. 4, 1977, Ser. No. 765,660
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—13



247,301
FISHING LURE RETRIEVER
Clemens A. Ostoski, 11600 Norgate, Bellefontaine Neighbors, Mo. 63138
Filed June 21, 1976, Ser. No. 697,776
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—31



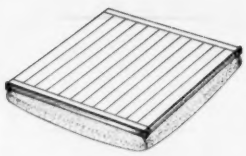
247,302
COMBINED HAND SPRAYER AND BOTTLE
Joseph Benedict Federico, Sarasota; Walter Herbert Wesner, Fort Lauderdale, and John Richard Cary, Miami Lakes, all of Fla., assignors to The AFA Corporation, Miami Lakes, Fla.
Continuation-in-part of Ser. No. 657,809, Feb. 13, 1976. This application Aug. 2, 1976, Ser. No. 710,757
The portion of the term of this patent subsequent to Jan. 25, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18

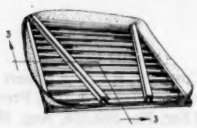


247,303
GUTTER CLEANER
Desmond James Boyd, 4 Livingstone Court, Mount Eliza 3930 Victoria, Australia
Filed Apr. 16, 1976, Ser. No. 677,635
Claims priority, application Australia, Sept. 29, 1975, 3352/75
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—34

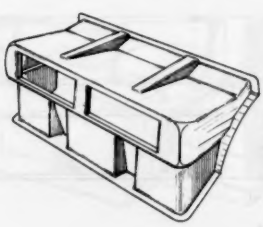
247,304
CRANK BAIT FISHING LURE
Kenneth M. Pruitt, 206 S. Pink St., Cherryville, N.C. 28201, and William O. Williams, Jr., 1309 Lynhurst Drive, Gastonia, N.C. 28052
Filed Nov. 22, 1976, Ser. No. 743,687
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

247,305
SOLAR HEATER
Normand Lysons Baxter, Lugarno, and Paul Frederick Norrie, Waitara, both of Australia, assignors to Bax Products Pty. Limited, Rockdale, Australia
Filed Dec. 31, 1975, Ser. No. 645,544
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127

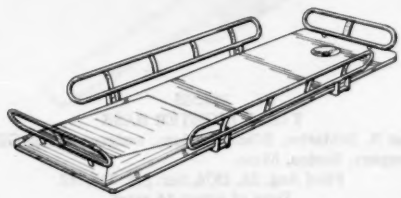




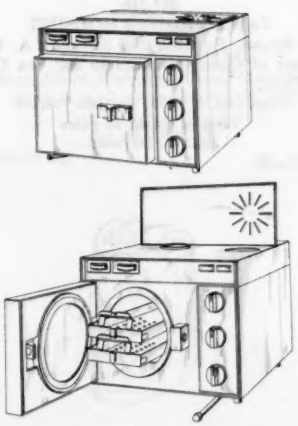
247,306
AIR CONDITIONER HOUSING
Robert S. Magee, 3410 Tanglewilde, Houston, Tex. 77063
Filed July 23, 1976, Ser. No. 708,207
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—142



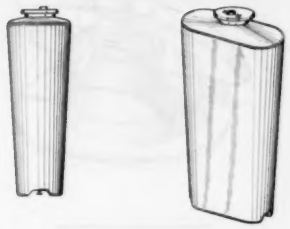
247,307
TABLE PLATE FOR PATIENT SUPPORTING TABLE
Hans Arne Valentin Johansson, Treharadsvagen 36, S-241 00 Eslov, Sweden
Filed Jan. 15, 1976, Ser. No. 649,532
Claims priority, application Sweden, Nov. 3, 1975, 752173
Term of patent 14 years
Int. Cl. D24—*01;* D6—*01*
U.S. Cl. D24—3



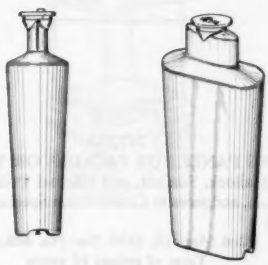
247,308
AUTOCLAVE
Danny M. Truette, Pineville, N.C., assignor to The Pelton & Crane Company
Filed Mar. 22, 1976, Ser. No. 668,995
Term of patent 14 years
Int. Cl. D24—*01;* D23—*04*
U.S. Cl. D24—9



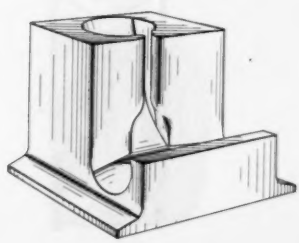
247,309
PLASTIC CONTAINER FOR STERILE LIQUID COLLECTION
Albert Safianoff, Rancho Palos Verdes, Calif., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Aug. 3, 1976, Ser. No. 711,327
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—56



247,310
PLASTIC CONTAINER FOR STERILE LIQUID COLLECTION
Albert Safianoff, Rancho Palos Verdes, Calif., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Aug. 3, 1976, Ser. No. 711,328
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—56



247,311
ARM ELEVATION PILLOW
Peter R. Carter, 3504 Lindenwood, Dallas, Tex. 75205
Filed June 4, 1976, Ser. No. 692,843
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64

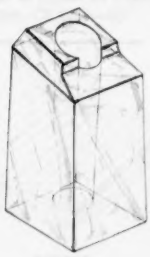


247,312
HEAD REST FOR A BACK MASSAGING CUSHION
Ernest R. Zeiss, Lombard, Ill., assignor to Associated Mills, Inc., Chicago, Ill.
Filed July 19, 1976, Ser. No. 706,194
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64

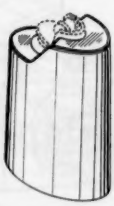
247,313
FACING PANEL FOR FACADES OR THE LIKE
Edward C. Hallock, Summit, and Michael Polifka, Spotswood, both of N.J., assignors to Construction Specialties, Inc., Cranford, N.J.
Filed Mar. 19, 1976, Ser. No. 668,602
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—87

247,314
FLOOR TILE
Stanley King, New York, N.Y., assignor to Dunlop Limited, London, England
Filed May 11, 1976, Ser. No. 685,292
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80

247,315
TABLE LIGHTER BASE
Joseph R. DiMatteo, Billerica, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Aug. 23, 1976, Ser. No. 716,782
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—39

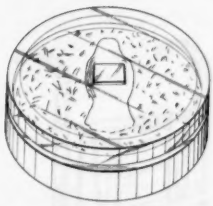


247,316
TABLE LIGHTER HOUSING
Thomas T. Beeson, Fairfield, and Salvatore A. La Monica, Derby, both of Conn., assignors to Bic Pen Corporation, Milford, Conn.
Filed Dec. 6, 1976, Ser. No. 748,106
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—39



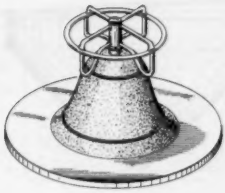
247,317
COSMETIC APPLICATOR
Jean Mantelet, 46-48, avenue Montaigne, 75008 - Paris, France
Filed July 26, 1976, Ser. No. 708,768
Claims priority, application France, Apr. 5, 1976, 74 701
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—7

247,318
BIRD COFFIN
Helen M. Bennett, 744 Pine Tree Road, Pittsburgh, Pa. 15243
Filed Mar. 22, 1976, Ser. No. 668,819
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D31—1

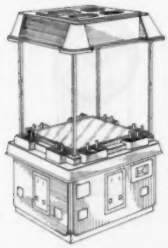


247,319
GOLF PUTTER HEAD
Samuel J. Barr, 500 N. Washington Ave., Titusville, Fla. 32780
Filed June 18, 1976, Ser. No. 697,340
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

247,320
PLAYGROUND ROUNDABOUT
Ronald W. Zick, Minneapolis, Minn., assignor to Game Time, Inc., Litchfield, Mich.
Filed July 26, 1976, Ser. No. 709,110
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 G

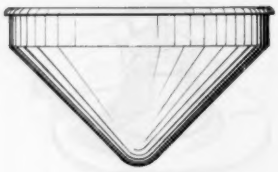


247,321
GAME CABINET
David M. Cook, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.
Filed July 29, 1976, Ser. No. 709,882
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 J



247,322
RETURN TOP
Robert C. Burroughs, 408 W. Deer Park Road, Gaithersburg, Md. 20760, assignor to Robert C. Burroughs
Filed Nov. 3, 1975, Ser. No. 628,550
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 BB

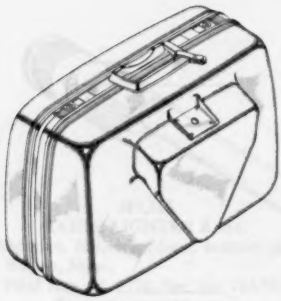
247,323
ROCKING TOY
Carl Risberg, 160 Hampshire, Beaconsfield, Quebec, Canada
Filed July 30, 1975, Ser. No. 600,451
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AE



247,324
COMBINED FLASHLIGHT ALARM AND DEFENSIVE ELECTRIC PROD
John L. Bugler, 401 E. 105th Terrace, Kansas City, Mo. 64131
Filed Aug. 27, 1976, Ser. No. 718,391
Term of patent 14 years
Int. Cl. D26—*02;* D10—*05;* D22—*02*
U.S. Cl. D48—24 A

247,325
RIBBON CARTRIDGE
Richard D. Trezise, San Jose, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed June 28, 1976, Ser. No. 700,416
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11A

247,326
DETACHABLE LUGGAGE CASE FOR A MOTORCYCLE
John A. Warren, Jr., Yorba Linda, Calif., assignor to Dan Gurney Cycle Products, Santa Ana, Calif.
Filed May 17, 1976, Ser. No. 687,371
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 F



247,327
COMBINED ORGANIZER FILE AND STORAGE UNIT FOR A VEHICLE SEAT
Charles W. Tracy, Tallahassee, Fla., assignor to Sargent-Sowell, Inc., Grand Prairie, Tex.
Division of Ser. No. 476,003, June 3, 1974, Pat. No. 243,974.
This application Dec. 13, 1976, Ser. No. 750,085
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 R

247,328
INFLATABLE UMBRELLA
Yutaka Yoshida, 1941-8 Manazuru, Manazurucho, Ashigarashimo, Kanagawa, Japan
Filed Nov. 24, 1975, Ser. No. 634,511
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—3 R

247,329

INFLATABLE UMBRELLA

Yutaka Yoshida, 1941-8, Manazuru, Manazurucho, Ashigarashimo, Kanagawa, Japan

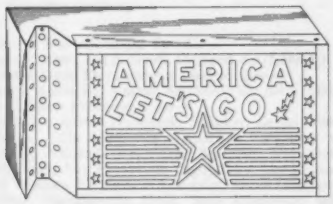
Filed Apr. 8, 1976, Ser. No. 675,193
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—3 R

247,330

ILLUMINATED SIGN

Ralph Kutschmende, 395 Manhattan Ave., Brooklyn, N.Y. 11211

Filed Mar. 26, 1975, Ser. No. 562,199
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R



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TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF FEBRUARY, 1978

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AB Akerlund & Rausing: *See—*
Davidsson, Sven; Christensson, Nils Bertil; and Axelsson, Per Hugo, 4,074,849, Cl. 229-1.50B.

AB Bahco Verktyg: *See—*
Jansson, Conny Erik, 4,074,597, Cl. 81-417.000.

AB Svenska Flaktfabriken: *See—*
de Feudis, Sergio, 4,074,921, Cl. 302-39.000.

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Abe, Takeshi, to Ricoh Co., Ltd. System for collecting data from meters placed at remote places. 4,075,607, Cl. 340-152.00R.

Abe, Tetsuo: *See—*
Hashimoto, Hiroshi; Abe, Tetsuo; and Kato, Akira, 4,074,425, Cl. 29-813.000.

Abell, Donald E.: *See—*
Seedorf, Jack H.; Hruda, Robert M.; and Abell, Donald E., 4,075,448, Cl. 200-262.000.

ACF Industries, Incorporated: *See—*
Hicks, Paul E., Jr.; and Hammonds, James C., 4,074,633, Cl. 105-368.00B.
Krug, John A., 4,074,577, Cl. 73-421.00B.
Lewis, Irwin M., 4,074,702, Cl. 137-625.660.

Ackerman, Roger G.; and Karstetter, Bruce R., to Corning Glass Works. Potassium ion-exchange on surface of beta-spodumene. 4,074,993, Cl. 65-30.00E.

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Jorgenson, Clyde R.; DeBoer, Harold M.; and Jorgenson, Ronald M., 4,075,374, Cl. 427-355.000.

Adams, Charles E.; Quackenbush, Harold E.; Harrer, Paul H.; Langford, Le Roy; and Cleek, Alvin L., to Allis-Chalmers Corporation. Compressed air seed planter. 4,074,830, Cl. 221-266.000.

Adams & Coltrin, Inc.: *See—*
Coltrin, George E., 4,074,893, Cl. 256-21.000.

Adams, Franklin Montague, to Price International, Inc. Masking tape applicator for pipe. 4,075,053, Cl. 156-391.000.

Adams, Stanley B.; Carbaugh, Frederick A.; and Cryder, John R., to Caterpillar Tractor Co. Pre-adjusted control module for construction vehicles. 4,074,690, Cl. 137-344.000.

Addressograph-Multigraph Corporation: *See—*
Bradbury, Wilburn F., 4,074,902, Cl. 271-34.000.

Adler, David George, to Sperry Rand Corporation. Linear actuator. 4,075,517, Cl. 310-13.000.

Aerpat A.G.: *See—*
Summerlin, Frederick Arthur, 4,074,554, Cl. 72-114.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Relyveld, Edgar Hans, 4,075,321, Cl. 424-92.000.

Agency of Industrial Science & Technology: *See—*
Okayama, Shigeo; and Kawakatsu, Hisazo, 4,075,488, Cl. 250-396.00R.
Yabe, Akira, 4,075,074, Cl. 204-158.00R.

AGFA-Gevaert Aktiengesellschaft: *See—*
Saleck, Wilhelm; and von Rintelen, Harald, 4,075,020, Cl. 96-94.00R.

AGFA-GEVAERT N.V.: *See—*
Priem, Jan Josef; and De Winter, Walter Frans, 4,075,023, Cl. 96-114.000.

Ainis, Herman; Lange, Charles F.; Mark, Abraham S.; and Scherr, George H., to Technical Research Affiliates, Inc. Detection of antigens by anti-body sensitized microbial particles. 4,075,315, Cl. 424-12.000.

Air Products and Chemicals, Inc.: *See—*
Doelp, Louis C.; Friedman, Lee; and Mitchell, Maurice M., 4,075,082, Cl. 208-10.000.

Airco, Inc.: *See—*
Bradshaw, Elmo F.; and Rakszawski, John F., 4,075,524, Cl. 310-249.000.

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Kondo, Toshio; Ishikawa, Masakazu; Katagiri, Masayoshi; and Kizaki, Jiro, 4,074,795, Cl. 188-73.300.

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Akerley, Arnold J.: *See—*
Smits, Donald M.; Daley, Patrick J.; and Akerley, Arnold J., 4,074,721, Cl. 128-461.000.

Akiyama, Shinichi; and Yamamoto, Haruhisa, to Nippon Zeon Co. Ltd. Process for preparing methacrylic acid. 4,075,244, Cl. 260-530.00N.

Aktiebolaget Tudor: *See—*
Borjesson, Anders; and Rehnberg, Tore, 4,074,422, Cl. 29-730.000.

Alarm Device Manufacturing, Co.: *See—*
Verger, Nathan; and Schmidt, Gerhard, 4,075,588, Cl. 335-207.000.

Alcan Research and Development Limited: *See—*
Bhilotra, Kaloo Raj Kumar, 4,075,067, Cl. 204-67.000.

Alexeeva, Ljubov Antonovna: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Rymareva, Tatyana Ivanovna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; and Alexeeva, Ljubov Antonovna, 4,075,168, Cl. 260-46.50R.
Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.

Alfieri, Romeo. Index cover for knock-out punch. 4,074,432, Cl. 30-360.000.

Allan, David E.: *See—*
Caulk, Robert H.; and Allan, David E., 4,075,258, Cl. 260-683.440.

Allen, Alvin, to Du Pont de Nemours, E. I., and Company. TiO_2 Pigment coated with dense silica and porous alumina/silica. 4,075,031, Cl. 106-300.000.

Allen, Frederick G., to Wood Industries, Inc. Paper web perforating machine. 4,074,599, Cl. 83-346.000.

Allied Chemical Corporation: *See—*
Li, Hsin Lang; Oswald, Hendrikus Johan; and Liland, Alfred Louis, 4,074,405, Cl. 28-257.000.
Lofquist, Robert Alden; and Haylock, John Christopher, 4,075,271, Cl. 264-210.00F.
Port, Eugene Baker; and Garofano, Norman Rutledge, 4,075,281, Cl. 423-206.00T.
Woolf, Cyril, deceased; Mares, Frank; and Oxenrider, Bryce C., 4,075,410, Cl. 560-87.000.

Allis-Chalmers Corporation: *See—*
Adams, Charles E.; Quackenbush, Harold E.; Harrer, Paul H.; Langford, Le Roy; and Cleek, Alvin L., 4,074,830, Cl. 221-266.000.

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Stern, Marvin J., 4,075,009, Cl. 75-170.000.

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Schmidt, Frederick O. G., 4,074,543, Cl. 66-193.000.

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Alton Box Board Company: *See—*
Wilkinson, Robert M., 4,075,372, Cl. 427-258.000.

Altshuler, John Henry: *See—*
Braun, Walter Jacob; Altshuler, John Henry; and Cherry, Peter Whitfield, 4,074,971, Cl. 23-230.00B.

Altstadter Verpackungs-Vertriebs GmbH: *See—*
Reil, Wilhelm, 4,074,961, Cl. 425-112.000.

Aluotto, Patrick F.: *See—*
Rhum, David; and Aluotto, Patrick F., 4,075,242, Cl. 560-190.000.

Alves, Ronald: *See—*
Wickersheim, Kenneth A., 4,075,493, Cl. 250-461.00R.

Ambrose, Richard J.; and Hayes, Robert A., to Firestone Tire & Rubber Company, The. Graft copolymers of polybutadiene and substituted polyacrylate. 4,075,186, Cl. 260-887.000.

American Cyanamid Company: *See—*
Capozza, Richard Carl, 4,074,366, Cl. 3-1.000.
Capozza, Richard Carl, 4,074,713, Cl. 128-92.00C.
Gastrock, William Henry; and Asato, Goro, 4,075,228, Cl. 260-332.30P.
Knapp, Paul William, Jr., 4,075,348, Cl. 424-300.000.

American Defibrator, Inc.: *See—*
Kollberg, Ture Eric, 4,074,803, Cl. 198-670.000.

American Gas Association: *See—*
Pangborn, Jon B.; Sharer, John C.; and Elkins, Robert H., 4,075,313, Cl. 423-658.000.

American Hoist & Derrick Company: *See—*
Garrett, Charles Ronald, 4,074,519, Cl. 59-95.000.

American Home Products Corporation: *See—*
Sarantakis, Dimitrios, 4,075,190, Cl. 260-112.50R.

American Hospital Supply Corporation: *See—*
Nielsen, Milton R.; and Olsen, Robert A., 4,074,434, Cl. 32-27.000.

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Lavins, Paul N., Jr., 4,075,450, Cl. 219-10.710.

American Monitor Corporation: *See*—
Denney, Jerry W., 4,074,972, Cl. 23-230.00B.
American Optical Corporation: *See*—
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Link, William Trevor; Rugge, Henry Ferdinand; and Jansen, William David, 4,074,711, Cl. 128-2.05A.
American Technical Ceramics, division of Phase Industries Inc.: *See*—
Seaman, Harry V., 4,075,556, Cl. 324-60.00C.
American Thermostat Corporation: *See*—
Levinn, Robert N., 4,075,678, Cl. 361-104.000.
Amosov, Vladimir Alexandrovich; Guschin, Alexandr Evgenievich; Efremov, Jury Nikolaevich; and Smirnov, Rudolf Evgenievich. Composition for treating cellulose-containing fibrous materials and method of producing composition for treating cellulose-containing materials. 4,075,028, Cl. 106-186.000.
AMP Incorporated: *See*—
Krider, Paul Robert, 4,074,929, Cl. 339-97.00R.
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Beaulier, Daniel A., 4,075,656, Cl. 358-13.000.
Lomax, John A.; and Martin, William J., 4,075,666, Cl. 360-11.000.
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Anchor Hocking Corporation: *See*—
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Anderka, Gerold; and Kuparinen, Lasse, to Koh-I-Noor Rapidograph, Inc. Process for the production of lettering or symbol templates. 4,074,414, Cl. 29-509.000.
Andersen, Deborah M.: *See*—
Dyckman, Edward J.; Andersen, Deborah M.; and Fischer, Eugene C., 4,075,319, Cl. 424-78.000.
Anderson, David G., to Miner Enterprises, Inc. Telescopic draft gear. 4,074,813, Cl. 213-24.000.
Anderson, Howard A.: *See*—
Wolfangel, Robert G.; and Anderson, Howard A., 4,075,314, Cl. 424-1.000.
Anderson, John H. Flower pot support holder. 4,074,882, Cl. 248-208.000.
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Anderson, Weston A., to Varian Associates, Inc. Reconstruction system and method for ultrasonic imaging. 4,074,564, Cl. 73-596.000.
Andersson, Sture Roland; and Elmessaar, Heino, to Atlas Copco Aktiebolag. Pneumatic impact tool. 4,074,777, Cl. 173-138.000.
Andersson, Ulf Ivan Gunnar: *See*—
Jonsson, Bjorn Erik Rutger; Andersson, Ulf Ivan Gunnar; and Bergman, Gustav Ruben, 4,075,466, Cl. 235-302.300.
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Andrews, Austin M., II: *See*—
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Ankudinov, Anatoly Kirillovich: *See*—
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Antoszewski, Alex Joseph, to Leigh Products, Inc. Pivoted locking wall bracket. 4,074,884, Cl. 248-289.00R.
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Armstrong Cork Company: *See*—
Gross, William G.; Long, Henry A., Jr.; and Yamshak, John R., 4,074,655, Cl. 118-410.000.
Arndt, Kenneth E.; Otto, Lonnie E., Jr.; and Siekmeier, David A., to Lindsay Manufacturing Company. Water drive system for a center pivot irrigation unit or the like. 4,074,783, Cl. 180-14.00R.
Arnon, Ruth: *See*—
Sela, Michael; Arnon, Ruth; and Chaitchik, Samario, 4,075,194, Cl. 260-112.50R.
Asada, Yoshiharu: *See*—
Kobayashi, Isao; Asada, Yoshiharu; and Kumakawa, Shiro, 4,075,274, Cl. 264-290.00T.
Asahi Glass Company Ltd.: *See*—
Furukawa, Yasuhiko; and Igarashi, Tsuyoshi, 4,075,381, Cl. 428-192.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Furuta, Tadaaki; Inagaki, Kenji; Mizoguchi, Yoshiyuki; Fujikawa, Noboru; and Kominami, Naoya, 4,075,100, Cl. 210-266.000.
Takasuka, Kaoru; Takahashi, Masatatsu; and Nishimura, Sadaji, 4,075,498, Cl. 250-562.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Okudaira, Sadao, 4,074,931, Cl. 350-184.000.
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; and Kawasaki, Masahiro, 4,075,641, Cl. 354-43.000.
Asai, Shin-Ichiro: *See*—
Horiie, Shigeki; Asai, Shin-Ichiro; Torikoshi, Takashi; Shirakawa, Kazuhiro; and Handa, Minoru, 4,075,253, Cl. 260-665.00R.
Asakura, Hideo: *See*—
Hishida, Yukio; Watanabe, Tomoyoshi; Hirayama, Takanobu; and Asakura, Hideo, 4,074,799, Cl. 197-151.000.
Asano, Kazuhiro, to Kabushiki Kaisha Daini Seikosha. Electronic timepiece with battery life display. 4,074,515, Cl. 58-23.0BA.
Asato, Goro: *See*—
Gastrock, William Henry; and Asato, Goro, 4,075,228, Cl. 260-332.30P.
Asbill, Clarence M., III: *See*—
Brakebill, Harold G.; Lewis, Jay L.; and Asbill, Clarence M., III, 4,074,855, Cl. 236-87.000.
Ashworth Bros., Inc.: *See*—
Bechtel, Alfred R., Jr., 4,074,392, Cl. 19-113.000.
Astron Innovations, Inc.: *See*—
Rollins, Ralph T., 4,074,664, Cl. 123-75.00B.
Atari, Inc.: *See*—
Salmon, D'Miles E., 4,075,621, Cl. 340-337.000.
Atkinson, James L.: *See*—
Boltinghouse, Joseph C.; and Atkinson, James L., 4,074,580, Cl. 74-5.60D.
Atkinson, Joseph G.: *See*—
Rokach, Joshua; Atkinson, Joseph G.; and Rooney, Clarence S., 4,075,225, Cl. 260-326.310.
Atlantic Richfield Company: *See*—
Breault, Homer; and Witt, Alvin E., 4,075,365, Cl. 427-36.000.
Frisch, Kurt Charles; and Russell, Donald Henry, 4,075,181, Cl. 260-77.50B.
Zak, Thomas Stephen, 4,075,128, Cl. 252-475.000.
Atlas Copco Aktiebolag: *See*—
Andersson, Sture Roland; and Elmessaar, Heino, 4,074,777, Cl. 173-138.000.
Atomic Energy of Canada Limited: *See*—
Pauluis, Gerard J. C. A., 4,074,974, Cl. 23-270.00R.
Attwood, Brian William: *See*—
Curry, Harold George; Attwood, Brian William; and White, Derek Graham Walter, 4,074,959, Cl. 425-81.100.
Hicklin, Denis Raymond; and Attwood, Brian William, 4,074,393, Cl. 19-303.000.

Automatic Equipment Development Corporation: *See*—
Johnston, James J., 4,074,928, Cl. 339-91.00R.

Automation Industries, Inc.: *See*—
Ball, David J., 4,074,927, Cl. 339-89.00M.

Automobiles Peugeot: *See*—
Le Salver, Robert, 4,074,525, Cl. 60-322.000.

Autophon Aktiengesellschaft: *See*—
Masur, Christian; and Stverak, Vaclav, 4,075,564, Cl. 325-55.000.

Averbukh, Alexandr Samoilovich: *See*—
Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Kudryakov, Mikhail Nikolaevich; Tsipkis, Alexandr Moiseevich; Yakovlev, Vladimir Germogenovich; Averbukh, Alexandr Samoilovich; Scherbakov, Jury Ilich; Yakobson, Natalia Dmitrievna; Semikozov, Vyacheslav Fedorovich; Medvedev, Viktor Vladimirovich; Yartsev, Valery Vasilievich; Kaganov, July Davydovich; Kuznetsov, Vladimir Ivanovich; and Sinelnikov, Alexandr Iosifovich, 4,074,773, Cl. 173-23.000.

Avery, Bennett W., to Caterpillar Tractor Co. Orbiting motor gear drive. 4,074,615, Cl. 91-490.000.

Avrus, Albert Vladimirovich: *See*—
Glikman, Mark Leonovich; Sapunar, Zakhar Isaevich; Avrus, Albert Vladimirovich; Gorokhovsky, Vladilen Alexandrovich; Fainberg, Evgeny Borisovich; Ivanov, Vladimir Alexandrovich; Shirkevich, Tatyana Leonidovna; and Sizov, Vadim Mikhailovich, 4,074,994, Cl. 65-44.000.

Axelsson, Per Hugo: *See*—
Davidsson, Sven; Christensson, Nils Bertil; and Axelsson, Per Hugo, 4,074,849, Cl. 229-1.50B.

Ayesh, Mark G. Reading bed. 4,074,374, Cl. 5-327.00R.

B. F. Goodrich Company, The: *See*—
Davy, David Larry, Sr., 4,075,520, Cl. 310-168.000.

Bach, Nicholas J.; and Kornfeld, Edmund C., to Eli Lilly and Company. Method of preparing 8,8-disubstituted-6-methylergolines and related compounds. 4,075,212, Cl. 260-285.500.

Bach, Nicholas J.: *See*—
Kornfeld, Edmund C.; and Bach, Nicholas J., 4,075,213, Cl. 260-285.500.

Bacskai, Robert, to Chevron Research Company. Process for the preparation of a catalyst containing pyrrolidone composition. 4,075,182, Cl. 260-78.00P.

Bader, Hartmann; and Bolleter, Ulrich, to Sulzer Brothers, Ltd. Cover for a weaving machine. 4,074,725, Cl. 139-1.00R.

Badertscher, Ernest; and Chaveron, Michel, to Societe d'Assistance Technique pour Produits Nestle S.A. Production of casein and caseinates. 4,075,196, Cl. 260-120.000.

Baer, Adrian D.; and Donovan, Terence M., to United States of America, Navy. Anti-reflective coating for high energy optical components. 4,075,385, Cl. 428-215.000.

Baikie, Hugh E., to Kenbudge Holdings Limited. Ice skate. 4,074,909, Cl. 280-11.120.

Baker, Henry Louis, to Communications Patents Limited. Automatic page selectors. 4,075,422, Cl. 178-23.00R.

Bakke, Even, to United States Filter Corporation. Wet electrostatic precipitators. 4,074,983, Cl. 55-118.000.

Balding, John V.: *See*—
Cieslak, Richard F.; and Balding, John V., 4,075,625, Cl. 340-384.00E.

Baldwin, Howard A.; Depp, Steven W.; Koelle, Alfred R.; and Freyman, Robert W., to United States of America, Energy. Interrogation, and detection system. 4,075,632, Cl. 343-6.80R.

Ball, David J., to Automation Industries, Inc. Electrical connector with insert member retaining means. 4,074,927, Cl. 339-89.00M.

Balz, Gunther W., to Roto-Finish Company. Improved finishing method. 4,074,472, Cl. 51-313.000.

Bandag Incorporated: *See*—
Brodie, Edwin T.; and Brewer, Donaldee, 4,075,047, Cl. 156-96.000.

Barber, Alfred William. Regulated power supply with combined series and shunt regulating transistors. 4,075,546, Cl. 323-22.00T.

Barendse, Nicolaas Cornelis Maria Emanuel: *See*—
Marx, Arthur Friedrich; and Barendse, Nicolaas Cornelis Maria Emanuel, 4,075,233, Cl. 260-397.300.

Barer, Sol J.; and Stockel, Richard F., to National Patent Development Corporation. N-chloro-chloroacetamides as herbicides. 4,075,007, Cl. 71-118.000.

Barley, Thomas A.: *See*—
Rast, Gustaf J., Jr.; and Barley, Thomas A., 4,075,512, Cl. 307-311.000.

Barna, Richard P.: *See*—
Duncan, Robert; and Barna, Richard P., 4,075,454, Cl. 219-137.00R.

Bartko, John: *See*—
Tarneja, Krishan S.; Johnson, Joseph E.; and Bartko, John, 4,075,037, Cl. 148-1.500.

BASF Aktiengesellschaft: *See*—
Hamprecht, Gerhard; Schirmer, Ulrich; Wuerzer, Bruno; and Retzlaff, Guenter, 4,075,004, Cl. 71-91.000.
Scheuermann, Horst; and Hettche, Albert, 4,075,211, Cl. 260-270.00H.

Bashkovich, Alexandr Pavlovich; Zimnukhova, Evgenia Semenovna; Prokopovich, Agnessa Vladimirovna; Polatovskaya, Olga Grigorievna; Pronina, Maria Ivanovna; Kulbakh, Valter Osvaldovich; Rivkina-Pevtsova, Khasya Ionovna; and Grinberg, Grigory Efimovich. Enzyme composition. 4,075,322, Cl. 424-94.000.

Basler Electric Company: *See*—
Gnaedinger, Donald J., 4,075,504, Cl. 307-66.000.

Bates Printing Specialties, Inc.: *See*—
Stipek, Charles J., Jr., 4,074,911, Cl. 283-6.000.

Battelle Memorial Institute: *See*—
Genequand, Pierre; and Joyeux, Didier, 4,075,535, Cl. 313-422.000.

Battle, Francis L., to Gulf & Western Industries, Inc. Digital loop detector with improved detection control. 4,075,563, Cl. 324-236.000.

Bauer, James J., to Clark Equipment Company. Hydraulic system of a skid steer loader. 4,074,782, Cl. 180-6.480.

Baum, Kurt; and Grakauskas, Vytautas, to United States of America, Air Force. 1,3-Bis(2,2,2-fluorodinitroethoxy)-2,2-bis(difluoramino) propane. 4,075,246, Cl. 260-584.00C.

Bayer Aktiengesellschaft: *See*—
Hoffmann, Hellmut; and Hammann, Ingeborg, 4,075,330, Cl. 424-200.000.
Kuhle, Engelbert; Klauke, Erich; and Eue, Ludwig, 4,075,235, Cl. 260-453.0RW.
Nordhofen, Benedikt, 4,074,573, Cl. 73-205.00R.
Paulus, Wilfried; and Rullmann, Karl-Heinz, 4,075,245, Cl. 260-561.0HL.
Schmidt, Manfred; Freitag, Dieter; and Nouvertne, Werner, 4,075,119, Cl. 252-182.000.
Vopel, Karl Heinz; Hellrung, Friedrich; and Berendes, Otto, 4,075,292, Cl. 260-986.000.

Beals, Charles E., to Caterpillar Tractor Co. Valving for dual radial piston motor. 4,074,614, Cl. 91-490.000.

Beane, David J.; and Kaplan, Ronald M., to United Technologies Corporation. Forging method. 4,074,559, Cl. 72-354.000.

Beaulier, Daniel A., to Ampex Corporation. Circuit for digitally encoding an analog television signal. 4,075,656, Cl. 358-13.000.

Beaver, John R.; and Kozlowski, George J., to Rudolph Beaver, Inc. Surgical knife assembly, surgical blade, and method of manufacture thereof. 4,074,431, Cl. 30-353.000.

Bechtel, Alfred R., Jr., to Ashworth Bros., Inc. Card clothing clipped top and a method of manufacturing therefor. 4,074,392, Cl. 19-113.000.

Beck, James Richard; and Gajewski, Robert Peter, to Eli Lilly and Company. Novel herbicidal method utilizing 1,4-diphenyl-3-pyrazolin-5-ones. 4,075,003, Cl. 71-92.000.

Beck, Willi K., to King-Seely Thermos Co. Rotatable shaft positioning means. 4,075,593, Cl. 337-312.000.

Beckman Instruments, Inc.: *See*—
Horrocks, Donald L., 4,075,480, Cl. 250-328.000.
Peart, Leslie Thomas, 4,075,597, Cl. 338-128.000.

Becton, Dickinson and Company: *See*—
Geiger, Kenneth E., 4,074,715, Cl. 128-218.00P.
North, Howard L., Jr., 4,074,562, Cl. 73-32.00A.

Beddell, Christopher Raymond; Lowe, Lawrence Alfred; and Wilkinson, Samuel, to Burroughs Wellcome Co. Biologically active amides. 4,075,191, Cl. 260-112.5LH.

Beesley, John Harold: *See*—
Sambrook, Ronald William; and Beesley, John Harold, 4,074,569, Cl. 73-15.600.

Beghin, Marcel, to Fives-Cail Babcock. Internally cooled roll. 4,074,750, Cl. 165-89.000.

Behn, Frederick H., to Construction Innovations, Inc. Reinforcing bar aligner and clamp. 4,074,897, Cl. 269-43.000.

Behrends, Bertwin E.: *See*—
Hoehn, Richard F.; Morris, Hugh C.; Therkildsen, Henry T.; and Behrends, Bertwin E., 4,074,796, Cl. 192-3.570.

Beilman, John L.; and Deazley, William R., to Calspan Corporation. Fluid speed measuring apparatus. 4,074,570, Cl. 73-182.000.

Bell, Graham Elsworth; and Winters, Alden Bernard, to Boeing Company, The. Clip shock mount. 4,074,491, Cl. 52-394.000.

Bell & Howell Company: *See*—
Flint, John R., 4,074,853, Cl. 235-477.000.

Bell, Malcolm R.: *See*—
Gelotte, Karl O.; Zalay, Andrew W.; and Bell, Malcolm R., 4,075,217, Cl. 260-296.00R.

Bell Telephone Laboratories, Incorporated: *See*—
Chin, Gilbert Yukyu; Plewes, John Travis; and Wonsiewicz, Bud Caesar, 4,075,437, Cl. 179-114.00R.
Sequin, Carlo Heinrich, 4,075,514, Cl. 307-355.000.

Bellasio, Elvio; and Cristiani, Franco, to Gruppo Lepetit S.p.A. 2-(Aryl)-3-(dimethylamino)butyl-3,4,5-trimethoxybenzoates. 4,075,241, Cl. 560-73.000.

Belleview, Inc.: *See*—
Stauble, Alfred G., 4,074,635, Cl. 108-27.000.

Bellhouse, Brian John, to National Research Development Corporation. Method for effecting heat or mass transfer. 4,075,091, Cl. 210-19.000.

Bellinder, Alex J. Knockdown lighting boxes and means for clamping the front panels thereof. 4,074,452, Cl. 40-571.000.

Belmonte, Carl: *See*—
Fulenwider, John E.; Belmonte, Carl; and Dakss, Mark L., 4,074,840, Cl. 225-96.500.

Beloit Corporation: *See*—
Ely, Donald E.; and Schmitt, Arnold J., 4,075,056, Cl. 162-305.000.

Belous, Viktor Mikhailovich: *See*—
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Rymareva, Tatyana Ivanovna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; and Alexeeva, Ljubov Antonovna, 4,075,168, Cl. 260-46.50R.

Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.

Bengtsson, Ulf. Nibbling tool. 4,074,603, Cl. 83-596.000.

Benner, Reimund: *See—*
Taubert, Klaus; Benner, Reimund; and Judt, Friedrich, 4,074,518, Cl. 59-15.000.

Bennett, Ronald: *See—*
Field, Peter Graham Spencer; and Bennett, Ronald, 4,075,250, Cl. 260-621.00C.

Bentley, Stanley L., to Ransburg Corporation. Electrostatic coating system. 4,075,677, Cl. 361-93.000.

Berberich, Joseph P.: *See—*
Bundy, Wayne M.; Berberich, Joseph P.; and Sastre, David, 4,075,030, Cl. 106-288.00B.

Berenblit, Vsevolod Volfovich: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Rymareva, Tatyana Ivanovna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; and Alexeeva, Ljubov Antonovna, 4,075,168, Cl. 260-46.50R.
Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.

Berendes, Otto: *See—*
Vopel, Karl Heinz; Hellrung, Friedrich; and Berendes, Otto, 4,075,292, Cl. 260-986.000.

Berg, Allan C.; Fitzpatrick, John W.; and Jones, Lewis O., to Xerox Corporation. Production of ferrite electrostatographic carrier materials having improved properties. 4,075,391, Cl. 428-407.000.

Berger, Michael A., to Xerox Corporation. Encoded print wheel system. 4,074,798, Cl. 197-53.000.

Bergman, Gustav Ruben: *See—*
Jonsson, Bjorn Erik Rutger; Andersson, Ulf Ivan Gunnar; and Bergman, Gustav Ruben, 4,075,466, Cl. 235-302.300.

Bergman, Mark Otho; and Rentmeester, Paul Clement, to Trane Company, The. Temperature and failure indicating probe for a bearing. 4,074,575, Cl. 73-344.000.

Berkin, Harvey: *See—*
Thorn, Herbert; and Berkin, Harvey, 4,074,460, Cl. 46-135.00R.

Berkling, Klaus, to Gesellschaft fur Mathematik und Datenverarbeitung mbH Bonn. Computer employing reduction language. 4,075,689, Cl. 364-200.000.

Bernstein, David H.: *See—*
Sorensen, Karsten; Bernstein, David H.; and Druke, Michael B., 4,075,692, Cl. 364-200.000.

Berstermann, Wilhelm: *See—*
Grisar, Ulrich; and Berstermann, Wilhelm, 4,074,936, Cl. 356-81.000.

Bertrand, Marcel J.: *See—*
van der Burg, Sjirk; Grosch, Karl A.; and Bertrand, Marcel J., 4,074,743, Cl. 152-355.000.

Besozzi, Alfio J.: *See—*
Foster, Alan W.; and Besozzi, Alfio J., 4,075,256, Cl. 260-680.00E.

Bethell, Michael R.: *See—*
Paul, George A.; Hegel, Robert W.; Bethell, Michael R.; Branham, Charles L.; and Utter, Allan D., 4,075,098, Cl. 210-168.000.

Beyeler, Theodor: *See—*
Hirsbrunner, Pierre; Beyeler, Theodor; and Shepherd, David, 4,075,329, Cl. 424-195.000.

Beyers, Joseph W.: *See—*
Christopher, Chris J.; Wenninger, Fred W.; Morris, Donald E.; Covington, Wayne F.; Folsom, Jerry B.; Beyers, Joseph W.; Nairn, John H.; and Osborne, Jeffrey C., 4,075,679, Cl. 364-200.000.

Bhilotra, Kaloo Raj Kumar, to Alcan Research and Development Limited. Production of aluminium. 4,075,067, Cl. 204-67.000.

Bickford, Gardner Lloyd, to Vickery, James R. Tripod assembly. 4,074,881, Cl. 248-188.700.

Biesel, John W. Drain system for protecting buildings against flooding and method. 4,074,684, Cl. 137-1.000.

Bills, Kenneth W., Jr.: *See—*
Briar, Herman P.; and Bills, Kenneth W., Jr., 4,074,563, Cl. 73-35.000.

Bilow, Norman; and Gardos, Michael N., to Hughes Aircraft Company. Heavy metal chalcogenide-polyimide lubricative composites. 4,075,111, Cl. 252-12.000.

Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., to Kendall Company, The. Syringe assembly. 4,074,714, Cl. 128-218.00P.

Biornstad, Peter; and Dolenc, Anton, to Escher Wyss Limited. Method of adjusting the contact pressure of a rolling mill and apparatus for the performance thereof. 4,074,624, Cl. 100-35.000.

Birchall, Donald Jack. Piezoelectric accelerometer transducer. 4,075,525, Cl. 310-329.000.

Bird Electronic Corporation: *See—*
Mecklenberg, Frank Howard, 4,075,554, Cl. 324-58.00B.

Bisutti, Guy. Concrete pile coupling device. 4,074,500, Cl. 52-726.000.

Blair, James M.; Sebring, Michael; Underwood, Warren H.; and Bley, William P., to Armour and Company. Poultry carcass-treating apparatus. 4,074,389, Cl. 17-11.000.

Blalock, Eugene D. Settling tank sludge collector. 4,075,109, Cl. 210-527.000.

Blasnik, William; and Halpert, David, to Lerner Manufacturing, Inc. Garment hanger construction. 4,074,838, Cl. 223-85.000.

Blaupunkt-Werke GmbH: *See—*
Haas, Dieter, 4,075,591, Cl. 336-200.000.

Blay, Alan George, to EMI Limited. Information display arrangements. 4,075,700, Cl. 364-515.000.

Bley, William P.: *See—*
Blair, James M.; Sebring, Michael; Underwood, Warren H.; and Bley, William P., 4,074,389, Cl. 17-11.000.

Blokker, Eduard Johannes Cornelis Marie: *See—*
Schelhaas, Ealbertus Willem; and Blokker, Eduard Johannes Cornelis Marie, 4,075,143, Cl. 260-17.200.

Bloxham, Gordon Foreman; Brezeale, Claude Paren; Cocco, Eugene Raymond; Hardesty, Edwin Charles; Small, Byron Lee; Steinert, Daniel Marion; and McGonigal, Charles, to Western Electric Company, Inc. Method of making retractile cords. 4,075,299, Cl. 264-25.000.

Bodewes, Hermanus J. A., to Rapistan Incorporated. Installation equipment with a driving mechanism. 4,074,805, Cl. 198-790.000.

Bodnar, Ernest Robert. Sheet metal panel. 4,074,495, Cl. 52-613.000.

Boeing Company, The: *See—*
Bell, Graham Elsworth; and Winters, Alden Bernard, 4,074,491, Cl. 52-394.000.

Bolick, Fred C., Jr.; Titus, Theodore, IV; and Mohammadioun, Said, to Lanier Electronic Laboratory, Inc. Cassette central dictation system. 4,075,436, Cl. 179-100.1DR.

Bolleter, Ulrich: *See—*
Bader, Hartmann; and Bolleter, Ulrich, 4,074,725, Cl. 139-1.00R.

Boltinghouse, Joseph C.; and Atkinson, James L., to Rockwell International Corporation. Electrostatic pickoff system for ball gyros of the electrostatic levitation type. 4,074,580, Cl. 74-5.60D.

Bolton, Frank H., deceased: *See—*
Morehouse, Donald S., Jr.; Bolton, Frank H., deceased; and Bolton, Kathryn M., administratrix, 4,075,134, Cl. 260-29.6RW.

Bolton, Kathryn M., administratrix: *See—*
Morehouse, Donald S., Jr.; Bolton, Frank H., deceased; and Bolton, Kathryn M., administratrix, 4,075,134, Cl. 260-29.6RW.

Bond, Charles Stephen. Music magic circular calculator. 4,074,607, Cl. 84-471.0SR.

Bond, Helen Inez. Contoured security pillow. 4,074,376, Cl. 5-338.000.

Bonnet, Jean-Claude; and Tesson, Gerard, to Manufacture de Produits Chimiques Protex. Thermally hardenable cationic resin from dicarboxylic acid, dialkanolamine and polyamine copolymer condensed with epichlorohydrin. 4,075,177, Cl. 260-75.00T.

Bonny Products, Inc.: *See—*
Steiner, Fred S.; and Cousins, Morison S., 4,075,135, Cl. 210-477.000.

Boodman, Norman S.; and Walter, Jack W., to United States Steel Corporation. Hydrogenation of alkylstyrene to produce alkylbenzene using copper chromite catalysts. 4,075,254, Cl. 260-667.000.

Borg-Warner Corporation: *See—*
Dick, Wesley Marion, 4,074,591, Cl. 74-674.000.
Falk, John Carl, 4,075,289, Cl. 260-890.000.
Schmittle, Karl V.; and Starner, Keith E., 4,074,753, Cl. 165-184.000.

Borjesson, Anders; and Rehnberg, Tore, to Aktiebolaget Tudor. Apparatus for holding electrode sets. 4,074,422, Cl. 29-730.000.

Borne, Jean Paul; and Naaijer, Geert Jan, to U.S. Philips Corporation. Method and apparatus for increasing the recording capacity of a disk. 4,075,665, Cl. 360-8.000.

Bosch, Paul: *See—*
Nonnemacher, Gerhard; Knodel, Emil; Robeller, Walter; and Bosch, Paul, 4,074,955, Cl. 417-218.000.

Boudakian, Max M., to Olin Corporation. Diazotization-fluorination in a medium of hydrogen fluoride-containing ammonium ions. 4,075,252, Cl. 260-649.00F.

Boudet, Georges; Charpentier, Jacques; Vinel, Rene; Desmoulins, Jean-Claude; and de Blic, Emmanuel, to SKF Compagnie d'Applications Mecaniques. Multi-stage hydraulic stretcher for elongated fasteners. 4,074,890, Cl. 254-29.00A.

Bousaid, Issam S., to Texaco Inc. Oil recovery process using a polymer slug with tapered surfactant concentration. 4,074,759, Cl. 166-273.000.

Bouverot, Rene; and Narbaits-Jaureguy, Jean-Raymond, to Thomson-CSF. Electromagnetic detector responsive to a modification of radiated field by an intruding metallic object. 4,075,553, Cl. 324-233.000.

Bouwmaatschappij Nederhorst B. V.: *See—*
Hendriks, Nicolaas Arie, 4,074,485, Cl. 52-224.000.

Bowe Bohler & Weber Maschinenfabrik: *See—*
Fuhring, Heinrich, 4,074,984, Cl. 55-163.000.

Bowler, Michael Kendal: *See—*
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Monk, James T.; Hailey, James L.; and Boyles, Tonnie M., 4,074,801, Cl. 198-304.000.

Bradbury, Wilburn F., to Addressograph-Multigraph Corporation. Sheet feeder. 4,074,902, Cl. 271-34.000.

Bradshaw, Elmo F.; and Rakszawski, John F., to Airco, Inc. Brush shunt connection. 4,075,524, Cl. 310-249.000.

Brady, John K.; and Noyes, Robert, to University of Illinois Foundation. Apparatus for gripping and holding small workpieces. 4,075,302, Cl. 269-43.000.

Braillon, Philibert Maurice. Magnetic plate comprising permanent magnets and electropermanent magnets. 4,075,589, Cl. 335-286.000.

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Hoffman, Neil R.; and Jansen, Johannes H., 4,074,910, Cl. 280-289.00R.

Brakebill, Harold G.; Lewis, Jay L.; and Asbill, Clarence M., III, to Robertshaw Controls Company. Adjustable bimetal construction and method of making the same. 4,074,855, Cl. 236-87.000.

Brammall, Inc.: *See*—
Schindler, Robert, 4,074,916, Cl. 292-307.00R.

Brams, Bernhard: *See*—
Koch, Heinz; Pawlowicz, Manfred; and Brams, Bernhard, 4,074,982, Cl. 51-92.00R.

Brandt, Michael W. Threaded blade holder. 4,074,426, Cl. 30-1.500.

Branham, Charles L.: *See*—
Paul, George A.; Hegel, Robert W.; Bethell, Michael R.; Branham, Charles L.; and Utter, Allan D., 4,075,098, Cl. 210-168.000.

Braun, Walter Jacob; Altshuler, John Henry; and Cherry, Peter Whitfield, to HemoTec, Inc. Apparatus and method for the pharmacological manipulation of the coagulation mechanism in blood and for signalling the event of blood coagulation. 4,074,971, Cl. 23-230.00B.

Breault, Homer; and Witt, Alvin E., to Atlantic Richfield Company. Turquoise-plastic-composite. 4,075,365, Cl. 427-36.000.

Breeden, William J.: *See*—
Pearce, Godfrey R.; Breeden, William J.; and See, Francis R., 4,074,417, Cl. 29-570.000.

Brewer, Donaldee: *See*—
Brodie, Edwin T.; and Brewer, Donaldee, 4,075,047, Cl. 156-96.000.

Brewer, Stephen J.: *See*—
Fleming, Ian D.; Turner, Michael K.; and Brewer, Stephen J., 4,075,061, Cl. 195-29.000.

Brewster, Robert W.: *See*—
Warren, Lyle D.; and Brewster, Robert W., 4,074,601, Cl. 83-425.200.

Brezeale, Claude Paren: *See*—
Bloxham, Gordon Foreman; Brezeale, Claude Paren; Cocco, Eugene Raymond; Hardesty, Edwin Charles; Small, Byron Lee; Steinert, Daniel Marion; and McGonigal, Charles, 4,075,299, Cl. 264-25.000.

Briar, Herman P.; and Bills, Kenneth W., Jr., to United States of America, Air Force. In-situ measurement apparatus. 4,074,563, Cl. 73-35.000.

Bridgestone Tire Company Limited: *See*—
Kawakami, Hiroshi; Tsukagawa, Yukio; and Nagaoka, Isao, 4,075,096, Cl. 210-96.00R.
Nishimura, Kazuhiro; Harada, Jumei; Migita, Tetsuhiko; and Matsunaga, Tsutomu, 4,075,275, Cl. 264-313.000.

Bridgham, John A.: *See*—
Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 4,075,481, Cl. 250-343.000.

Bright, Robert G., to Draftex Development AG. Flexible channel-shaped sealing and guiding strips. 4,074,465, Cl. 49-491.000.

Broad, Roy M., to Scott & Fetzer Company, The. High voltage electrical connector. 4,074,926, Cl. 339-60.00R.

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Brockschmidt, Willis H.; Brockschmidt, Robert W.; and Grabenhofer, John D., 4,074,561, Cl. 73-17.00R.

Brockschmidt, Willis H.; Brockschmidt, Robert W.; and Grabenhofer, John D., to Fuel Research & Instrument Co. Means for measuring the plasticity of coal. 4,074,561, Cl. 73-17.00R.

Brodie, Edwin T.; and Brewer, Donaldee, to Bandag Incorporated. Tire retreading system. 4,075,047, Cl. 156-96.000.

Brooks & Perkins, Incorporated: *See*—
Snow, Conley H.; and Messerschmidt, Rudolph (said Snow assors. to), 4,074,634, Cl. 105-493.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Hishida, Yukio; Watanabe, Tomoyoshi; Hirayama, Takanobu; and Asakura, Hideo, 4,074,799, Cl. 197-151.000.

Brower, Robert W., to C. O. Porter Machinery Company. Defecting saw. 4,074,602, Cl. 83-471.200.

Brown, Cicero C., deceased; and by Brown, Joe R., executor. Drilling assembly. 4,074,774, Cl. 173-44.000.

Brown Company: *See*—
Smith, Floyd S., 4,075,107, Cl. 210-493.00R.

Brown, Edgar D., Jr.; and Traver, Frank J., to General Electric Company. Silicone fluid useful as a brake fluid. 4,075,115, Cl. 252-75.000.

Brown, Harold J.: *See*—
Keren, Eitan; and Brown, Harold J., 4,074,505, Cl. 53-28.000.

Brown, Joe R., executor: *See*—
Brown, Cicero C., deceased; and Brown, Joe R., executor, 4,074,774, Cl. 173-44.000.

Brown & Root, Inc.: *See*—
Lochridge, Joe Cooper, 4,074,541, Cl. 61-110.000.

Brown & Williamson Tobacco Corporation: *See*—
Kohnhorst, Earl E., 4,074,722, Cl. 131-8.00R.

Brunetti, Heimo: *See*—
Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, 4,075,165, Cl. 260-45.80N.

Bruno, Stephen James; Dunn, Stephen Alfred; and Raber, Marvin, to Combustion Engineering, Inc. Reactor power reduction system and method. 4,075,059, Cl. 176-22.000.

Brunswick Corporation: *See*—
Panzera, Carlino, 4,075,364, Cl. 427-34.000.

Brusasco, Enzo, to Roltra S.p.A. Screw-nut screw transmission coupling. 4,074,587, Cl. 74-424.80R.

Bryzzhev, Lev Dmitrievich; and Kupko, Viktor Semenovich. Fluid pressure measuring device. 4,074,576, Cl. 73-702.000.

Brzozowski, Paul Charles, to Du Pont de Nemours, E. I., and Company. Method of trimming photoresist film. 4,075,051, Cl. 156-236.000.

Brzozowski, Stanley F.; and Cooper, Joseph E., to PPG Industries, Inc. Method of preparing anhydrous boric acid-containing glass batch. 4,074,989, Cl. 65-27.000.

Brzozowski, Stanley F.; and Cooper, Joseph E., to PPG Industries, Inc. Method of preparing colemanite-containing glass batch. 4,074,990, Cl. 65-27.000.

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Bucher, James L.: *See*—
Lupton, Daniel C.; Vermilion, Donn R.; and Bucher, James L., 4,075,048, Cl. 156-136.000.

Budde, Antonius Wilhelmus Hermanus; and Wiggers, Johannes Bernardus Maria, to Ingenieursbureau Dwars, Heederik en Verhey B.V. Surface aerator. 4,074,953, Cl. 416-183.000.

Budzich, Tadeusz. Load responsive system pump controls. 4,074,529, Cl. 60-445.000.

Building Components Research, Inc.: *See*—
Wahlquist, Carl D., 4,074,475, Cl. 52-70.000.

Bullis, Robert H.; Meyerand, Russell G., Jr.; and Wiegand, Walter J., Jr., to United Technologies Corporation. Method and apparatus for sensing the flux of a flowing fluid. 4,074,572, Cl. 73-194.00F.

Bulova Watch Company, Inc.: *See*—
Koehler, Dale R.; Sagarino, Robert F.; and Sauter, Charles A., 4,075,518, Cl. 310-49.00R.

Bunda, Tsuchio: *See*—
Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, 4,074,661, Cl. 123-3.000.

Bundy, Wayne M.; Berberich, Joseph P.; and Sastre, David, to Yara Engineering Corporation. High bulking clay pigments and methods of making the same. 4,075,030, Cl. 106-288.00B.

Bunker Ramo Corporation: *See*—
Davis, John Stephen; Larson, Kenneth Norman; and Phalen, Frank William, 4,075,691, Cl. 364-200.000.

Burdzinski, Boguslaw: *See*—
Daniels, Lawrence H.; Hood, Murray C.; and Burdzinski, Boguslaw, 4,074,487, Cl. 52-236.300.

Burgess, Thomas H., to Fischer & Porter Co. Obstacle assembly for vortex type flowmeter. 4,074,571, Cl. 73-194.00B.

Burke, William D.; Higginbottom, Harold P.; and Le Blanc, John R., to Monsanto Company. Phenolic resin and battery separator impregnated therewith. 4,075,403, Cl. 429-253.000.

Burkett, Joseph C.; and Harshbarger, Harry L., to Genoa Coal Company. Ground conductor monitoring system and method. 4,075,675, Cl. 361-48.000.

Burlingame, Richard D.; and Markels, Michael, Jr., to Ogden Metals, Inc.; and Versar, Inc. Passivating metallic cuttings and turnings. 4,075,370, Cl. 427-216.000.

Burmah Oil Trading Limited: *See*—
Field, Peter Graham Spencer; and Bennett, Ronald, 4,075,250, Cl. 260-621.00C.

Burns, David J.; Mohaupt, Udo H.; and Yie, Gene G., to Institute of Gas Technology. High pressure pulsed water jet apparatus and process. 4,074,858, Cl. 239-172.000.

Burov, Atanas Tzvetanov; Simidchieva, Penka Atanassova; and Kolev, Konstantin Nikolaev, to Ziafop pri Ban. Positive-working photographic process and radiation elements utilizing a chalcogenide of arsenic imaging compound and a noble plating metal. 4,075,016, Cl. 96-48.0PD.

Burroughs Corporation: *See*—
Walton, Tommy L., 4,075,420, Cl. 174-117.00F.

Burroughs Wellcome Co.: *See*—
Beddell, Christopher Raymond; Lowe, Lawrence Alfred; and Wilkinson, Samuel, 4,075,191, Cl. 260-112.5LH.

Burton, Henry W. G. Kit for converting single-glazed window to double-glazed window. 4,074,480, Cl. 52-127.000.

Bushnell, David William. Domestic food mixers. 4,074,584, Cl. 74-421.00A.

Busler, Albert, to Hilti Aktiengesellschaft. Anchor bolt assembly. 4,074,609, Cl. 85-77.000.

Butler, David M. Solar converter. 4,075,034, Cl. 136-89.0PC.

Butler, Donald E., to Parke, Davis & Company. Imidazopyrazolodiazepine compounds. 4,075,408, Cl. 548-324.000.
BWG Bergwerk-und Walzwerk Maschinenbau Gesellschaft mit beschrankter Haftung: *See—*
Noe, Oskar, 4,074,555, Cl. 72-128.000.
C.A.V. Limited: *See—*
Skinner, Robert Thomas John, 4,074,667, Cl. 123-139.0AQ.
C. O. Porter Machinery Company: *See—*
Brower, Robert W., 4,074,602, Cl. 83-471.200.
Cailliot, Serge Leon Louis, to Societe Normande de Services; Anvar Agence Nationale de Valorisation de la Recherche; Societe Generale pour le Financement de l'Innovation Soginnove; Cor, Bertrand; and Gastinne, Arnaud, part interest to each. Infusion-making machine. 4,074,621, Cl. 99-286.000.
Calder, Oliver J. Reversible spray tip. 4,074,857, Cl. 239-119.000.
Calgon Corporation: *See—*
Schaper, Raymond Joseph, 4,075,136, Cl. 260-2.00R.
Calle, Jaime; and Chelberg, Lawrence W., to Honeywell Information Systems Inc. Input/output cache system including bypass capability. 4,075,686, Cl. 364-200.000.
Calspan Corporation: *See—*
Beilman, John L.; and Deazley, William R., 4,074,570, Cl. 73-182.000.
Calviello, Joseph A., to Cutler-Hammer, Inc. Millimeter wave semiconductor device. 4,075,650, Cl. 357-15.000.
Campbell, Cyrill John; and Liu, Daniel Ting Hsiu, to Parke, Davis & Company. Process for producing intravenous immune globulin. 4,075,193, Cl. 260-112.00B.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Gray, Thomas J.; and Wojtowicz, Jan, 4,074,733, Cl. 141-32.000.
Canadian Patents and Development Limited: *See—*
Jorgensen, Erik; Roy, Dibyendu N.; and Kondo, Edward S., 4,075,327, Cl. 424-273.00R.
Wight, James S.; Chudobiak, Walter J.; and Makios, Vassilios, 4,075,555, Cl. 324-58.50R.
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Eckles, William Edward; and Canaris, Valerie, 4,075,066, Cl. 204-55.00R.
Canevari, Louis T.: *See—*
Schubert, Keith E.; and Canevari, Louis T., 4,074,574, Cl. 74-335.000.
Canon Kabushiki Kaisha: *See—*
Kawabata, Yoichi; and Machida, Minoru, 4,075,705, Cl. 364-752.000.
Sakamaki, Hisashi; and Ohtani, Toshiyuki, 4,075,456, Cl. 219-216.000.
Shinoda, Nobuhiko; and Kusumoto, Tadao, 4,075,696, Cl. 364-404.000.
Cantor, Paul A.: *See—*
Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., 4,075,108, Cl. 210-500.00M.
Capozza, Richard Carl, to American Cyanamid Company. Poly(N-acetyl-D-glucosamine) products. 4,074,366, Cl. 3-1.000.
Capozza, Richard Carl, to American Cyanamid Company. Poly(N-acetyl-D-glucosamine) products. 4,074,713, Cl. 128-92.00C.
Capriotti, Alfred J.; Lazzaretti, Louis G.; and O'Donnell, Brian, to United States Steel Corporation. Mold discharge rack gapping apparatus. 4,074,439, Cl. 33-286.000.
Capriotti, Alfred J., to United States Steel Corporation. Torch and cutoff table arrangement. 4,074,895, Cl. 266-50.000.
Carbaugh, Frederick A.: *See—*
Adams, Stanley B.; Carbaugh, Frederick A.; and Cryder, John R., 4,074,690, Cl. 137-344.000.
Carborundum Company, The: *See—*
Economy, James; Jun, Choll K.; and Lin, Ruey Y., 4,075,276, Cl. 264-332.000.
Carlson, Ronald H., to FMC Corporation. Sodium hypochlorite treatment for removal of cyanurate compounds from aqueous waste streams. 4,075,094, Cl. 210-62.000.
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Komanduri, Rangachary; and Shaw, Milton C., 4,074,471, Cl. 51-295.000.
Carson, Michael David Nisbet: *See—*
Dorfman, Jan William; Carson, Michael David Nisbet; and Rolston, George Angus, 4,074,646, Cl. 114-39.000.
Case, Richard P., to Franklin Manufacturing Company. Bimetal lid lock. 4,074,545, Cl. 68-12.00R.
Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*
Greve, Heinz Gunter; and Resag, Klaus, 4,075,409, Cl. 560-36.000.
Cassidy, Dale A.: *See—*
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Castagna, Herman; Gravey, Guy; and Roth, Andre, to Metaux Speciaux S.A. Process for recovering molybdenum values from spent catalysts. 4,075,277, Cl. 423-55.000.
Castaigne, Albert Rene Joseph, to Centre d'Etudes Pour l'Industrie Pharmaceutique. Thieno-pyridine derivatives. 4,075,215, Cl. 260-294.80C.
Castleman, B. Wayne; and Schluter, Bernard C., to Honeywell Inc. Ionization cell for sensing and measuring gaseous impurities. 4,075,550, Cl. 324-33.000.
Castonguay, Roger N.; and Jencks, Charles L., to General Electric Company. Undervoltage release device for circuit breakers. 4,075,584, Cl. 335-20.000.
Catallo, Frank. Folder for web materials. 4,074,901, Cl. 270-79.000.
Caterpillar Tractor Co.: *See—*
Adams, Stanley B.; Carbaugh, Frederick A.; and Cryder, John R., 4,074,690, Cl. 137-344.000.
Avery, Bennett W., 4,074,615, Cl. 91-490.000.
Beals, Charles E., 4,074,614, Cl. 91-490.000.
Cochran, Thomas E., 4,074,942, Cl. 404-121.000.
Cole, Carroll Richard, 4,074,767, Cl. 172-781.000.
Eftefield, Larry G., 4,074,896, Cl. 267-139.000.
Gale, Preston Lee; and Fair, Jack E., 4,074,616, Cl. 92-222.000.
Gill, Stephen H.; Knell, Harvey A.; and Tucker, Joseph M., III, 4,074,820, Cl. 214-138.00R.
Hoehn, Richard F.; Morris, Hugh C.; Therkildsen, Henry T.; and Behrends, Bertwin E., 4,074,796, Cl. 192-3.570.
Karstensen, Karl W.; and Smith, Brace C., 4,075,562, Cl. 324-173.000.
Lanz, William E.; and Stepe, Visvaldis A., 4,074,449, Cl. 37-141.00R.
Muntjanoff, John R., 4,074,613, Cl. 91-413.000.
Smith, Duane R., 4,074,703, Cl. 137-798.000.
Sons, Charles C., Jr., 4,075,054, Cl. 156-414.000.
Stedman, Robert N., 4,074,768, Cl. 172-796.000.
Stevens, W. Gene, 4,074,581, Cl. 74-15.660.
Stevens, W. Gene; and Windish, Willis E., 4,074,592, Cl. 74-740.000.
Catlett, Richard E., to Raymond Lee Organization, Inc., The, a part interest. Fly gun. 4,074,458, Cl. 43-139.000.
CATV Components Co.: *See—*
D'Arcangelis, Timothy, 4,075,566, Cl. 325-369.000.
Caulk, Robert H.; and Allan, David E., to Exxon Research & Engineering Co. Isoparaffin olefin alkylation utilizing high intensity mixing. 4,075,258, Cl. 260-683.440.
Cavey, William: *See—*
Mowbray, Warwick; Hart, Richard; and Cavey, William, 4,074,659, Cl. 119-159.000.
Cavigelli, George A., to American Optical Corporation. Isolation amplifier having improved fidelity. 4,075,572, Cl. 330-10.000.
Cavil, David T.; Hansen, Einar T.; and Schmidt, Henry J., to Outboard Marine Corporation. Rotor controlled automatic spark advance. 4,074,669, Cl. 123-148.0CC.
Caviness, Alton L.: *See—*
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CCL Systems Limited: *See—*
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Cecil Instruments Manufacturing Limited: *See—*
Tarbet, Cecil Sidney Charles, 4,074,940, Cl. 356-246.000.
Celanese Corporation: *See—*
Jones, Rufus S., Jr.; Tan, Marshall; and Choe, Eui Won, 4,075,269, Cl. 264-184.000.
Rhum, David; and Aluotto, Patrick F., 4,075,242, Cl. 560-190.000.
Trapasso, Louis E.; and Horback, William B., 4,075,387, Cl. 428-288.000.
Centaur Floor Machines Ltd.: *See—*
Arato, Paul; Lelkes, Antony; and Reid, Larry Ronald, 4,074,387, Cl. 15-322.000.
Centenary Central, Inc.: *See—*
Sauer, Louis E.; and Miller, Orville C., 4,074,595, Cl. 76-107.00C.
Centralny Osrodek Projektowo-Konstrukcyjny Maszyn Gorniczych "Komag": *See—*
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Centre d'Etudes Pour l'Industrie Pharmaceutique: *See—*
Castaigne, Albert Rene Joseph, 4,075,215, Cl. 260-294.80C.
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Chambley, Phillip W.; and Norris, Alan H., to Champion International Corporation. Self twist yarn strand system. 4,074,511, Cl. 57-34.0AT.
Chamblin, Kenneth Donald. Indicator for tire wear patterns. 4,074,742, Cl. 152-330.00A.
Champion International Corporation: *See—*
Chambley, Phillip W.; and Norris, Alan H., 4,074,511, Cl. 57-34.0AT.
Vassiliades, Anthony E.; and Vincent, David N., 4,075,389, Cl. 428-306.000.
Chaney, Robert L.: *See—*
Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 4,075,481, Cl. 250-343.000.
Chano, Takashi; and Masuda, Kohji, to Tokyo Juki Kogyo Kabushiki Kaisha; and Kayaba Industry Co., Ltd. Automatic sewing machine. 4,074,640, Cl. 112-121.110.
Chapman, Benjamin E.; Moore, Danny R.; and Phillips, Arthur F., to Procter & Gamble Company, The. Disposable nonwoven surgical towel and method of making it. 4,075,382, Cl. 428-192.000.
Chaprnka, Anthony G.; Sun, Shan C.; and Vercellotti, Leonard C., to Westinghouse Electric Corporation. Technique for extending the range of a signal measuring circuit. 4,075,559, Cl. 324-115.000.
Charcon Products Limited: *See—*
Knill, Kenneth George; Bowler, Michael Kendal; and Hambleton, Peter, 4,075,027, Cl. 106-99.000.
Charpentier, Jacques: *See—*
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Chaveron, Michel: *See—*
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Chefranova, Edit Konstantinovna: *See*—
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Zimnukhov, Viktor Alexandrovich; Miroshnikova, Lidia Alexeevna; Kimel, Esfir Abramovna; Chefranova, Edit Konstantinovna; Guseva, Valentina Ivanovna; and Masagutova, Ljudmila Vladimirovna, 4,075,166, Cl. 260-45.95H.
Chelberg, Lawrence W.: *See*—
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Chemetron Corporation: *See*—
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Chemische Werke Huels Aktiengesellschaft: *See*—
Denzel, Horst; and Hahmann, Otto, 4,075,290, Cl. 260-897.00A.
Chen, Thomas T., to Rockwell International Corporation. Large capacity major-minor loop bubble domain memory with redundancy. 4,075,708, Cl. 365-2.000.
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Cheung, John B.; and Murman, Earll M., to United States of America, Interior. Backwashing system for slurry pick-up used in hydraulic borehole mining devices. 4,074,779, Cl. 175-314.000.
Chevron Research Company: *See*—
Bacskai, Robert, 4,075,182, Cl. 260-78.00P.
Edwards, Laroy H., 4,075,347, Cl. 424-275.000.
Stevens, Robert A., 4,074,763, Cl. 166-325.000.
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Colbachini, Daciano; and Chiarotto, Romeo, 4,074,790, Cl. 182-63.000.
Chin, Gilbert Yukyu; Plewes, John Travis; and Wonsiewicz, Bud Caesar, to Bell Telephone Laboratories, Incorporated. Composition, processing and devices including magnetic alloy. 4,075,437, Cl. 179-114.00R.
Chisum, Finis Lavell. Method and apparatus for transporting one vehicle by another. 4,074,822, Cl. 214-152.000.
Chiyoda Chemical Engineering & Construction Co., Ltd.: *See*—
Morimoto, Tatsuo; Nakamura, Munekazu; Inooka, Masayoshi; and Yawata, Teizaburo, 4,075,125, Cl. 252-455.00R.
Chloride, Incorporated: *See*—
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Chmela, Frank P.: *See*—
Deshich, Dushan C.; Chmela, Frank P.; and Kufner, Kenneth L., 4,074,424, Cl. 29-753.000.
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Chou, Ta-Sen, to Eli Lilly and Company. Process for preparing a 3-exomethylenecepham sulfoxide from penicillin sulfoxides. 4,075,203, Cl. 544-18.000.
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Christensson, Nils Bertil: *See*—
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Christian, Lawrence D., to Exxon Production Research Company. Method for producing geothermal energy and minerals. 4,074,754, Cl. 166-245.000.
Christian Services, Inc.: *See*—
Lindbloom, John L., 4,074,371, Cl. 5-13.000.
Christie, John B.: *See*—
Wescott, Robert D.; and Christie, John B., 4,074,852, Cl. 235-463.000.
Christopher, Chris J.; Wenninger, Fred W.; Morris, Donald E.; Covington, Wayne F.; Folsom, Jerry B.; Beyers, Joseph W.; Nairn, John H.; and Osborne, Jeffrey C., to Hewlett-Packard Company. Programmable calculator. 4,075,679, Cl. 364-200.000.
Chromalloy American Corporation: *See*—
Hodgson, James H., 4,074,639, Cl. 111-6.000.
Chudobiak, Walter J.: *See*—
Wight, James S.; Chudobiak, Walter J.; and Makios, Vassilios, 4,075,555, Cl. 324-58.50R.
Chugunov, Viktor Dmitrievich: *See*—
Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Kudryakov, Mikhail Nikolaevich; Tsipkis, Alexandr Moiseevich; Yakovlev, Vladimir Germogenovich; Averbukh, Alexandr Samoilovich; Scherbakov, Jury Ilich; Yakobson, Natalia Dmitrievna; Semikozov, Vyacheslav Fedorovich; Medvedev, Viktor Vladimirovich; Yartsev, Valery Vasilievich; Kaganov, July Davydovich; Kuznetsov, Vladimir Ivanovich; and Sinelnikov, Alexandr Iosifovich, 4,074,773, Cl. 173-23.000.
Chung, William John: *See*—
Mitchell, Robert Lee; and Chung, William John, 4,075,317, Cl. 424-52.000.
Churillo, Charles J.: *See*—
Lock, William E.; and Churillo, Charles J., 4,074,610, Cl. 89-34.000.
Ciarico, Anthony J.: *See*—
Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., 4,074,714, Cl. 128-218.00P.
Ciba-Geigy Corporation: *See*—
Florer, James W., 4,075,267, Cl. 264-94.000.
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,075,349, Cl. 424-301.000.
Kray, Raymond J., 4,075,185, Cl. 260-79.30M.
Lacroix, Roger; and Haberli, Roland, 4,074,966, Cl. 8-41.00R.
Mowbray, Warwick; Hart, Richard; and Cavey, William, 4,074,659, Cl. 119-159.000.
Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, 4,075,165, Cl. 260-45.80N.
Spivack, John D.; and Dexter, Martin, 4,075,161, Cl. 260-45.80A.
Wilhelm, Max; Eichenberger, Kurt; Schroter, Herbert; and Ostermayer, Franz, 4,075,208, Cl. 260-256.40C.
Wilhelm, Max; Eichenberger, Kurt; Schroter, Herbert; and Ostermayer, Franz, 4,075,335, Cl. 424-244.000.
Cieslak, Richard F.; and Balding, John V., to Industrial Electronics Service Co. Audible electronic warning system. 4,075,625, Cl. 340-384.00E.
Cina, Ronald A.; and Kluge, Albert D., to Roberts Corporation. Automatic apparatus for producing molds using chemically bonded sands. 4,074,744, Cl. 164-187.000.
Cincinnati Milacron-Heald Corporation: *See*—
Robillard, Edward George, 4,074,467, Cl. 51-165.920.
Cincinnati Milacron, Inc.: *See*—
Kelly, Ralph; and Ritter, Edmond Jean, 4,075,318, Cl. 424-70.000.
Ciszek, Theodore Frank; and Schwuttke, Guenter Herbert, to International Business Machines Corporation. Method and apparatus for forming an elongated silicon crystalline body using a <110>{21-1}orientated seed crystal. 4,075,055, Cl. 156-608.000.
Cities Service Company: *See*—
Gregoli, Armand A., 4,075,081, Cl. 208-11.00R.
Cito Kunststoffe und Verpackungsfolien Erich Gilberg KG: *See*—
Sander, Bernd, 4,074,506, Cl. 53-59.00R.
City of Hope National Medical Center: *See*—
Tiep, Brian L., 4,074,710, Cl. 128-2.05P.
CKD Praha, oborovy podnik: *See*—
Jurca, Milos, 4,075,557, Cl. 324-62.000.
Clark Equipment Company: *See*—
Bauer, James J., 4,074,782, Cl. 180-6.480.
Clark, Gary E.; Frielinghaus, Klaus H.; and Smith, Barry L., to General Signal Corporation. Track signalling system. 4,074,879, Cl. 246-37.000.
Clarke, John Elwood; Andrews, Austin M., II; Gertner, Edward R.; Longo, Joseph T.; and Pasko, John G., to Rockwell International Corporation. Liquid phase epitaxy method of growing a junction between two semiconductive materials utilizing an interrupted growth technique. 4,075,043, Cl. 148-171.000.
Clarke, Robert John; Hundy, Guy Francis; and Zimmern, Bernard, to Monovis B. V. Screw compressors. 4,074,957, Cl. 418-195.000.
Cleek, Alvin L.: *See*—
Adams, Charles E.; Quackenbush, Harold E.; Harrer, Paul H.; Langford, Le Roy; and Cleek, Alvin L., 4,074,830, Cl. 221-266.000.
Cline, Harvey E.: *See*—
Anthony, Thomas R.; and Cline, Harvey E., 4,075,038, Cl. 148-1.500.
Close, Ralph E.; and Oroshnik, William, to SCM Corporation. 3,7,11-Trimethyldodeca-1,2-diene. 4,075,257, Cl. 260-680.00R.
Clothier, Darrell S. Low tire alarm. 4,075,602, Cl. 340-58.000.
Cluett, Peabody & Co., Inc.: *See*—
Lawrence, Jackson, 4,074,969, Cl. 8-125.000.
CMI Corporation: *See*—
Jakob, Herbert E.; and Garbelman, David L., 4,075,710, Cl. 366-25.000.
Coale, Harold D., to Phillips Petroleum Company. Flexible product made from a poly(phenylene sulfide) blend and method of making same. 4,075,158, Cl. 260-42.170.
Cocco, Eugene Raymond: *See*—
Bloxham, Gordon Foreman; Brezeale, Claude Paren; Cocco, Eugene Raymond; Hardesty, Edwin Charles; Small, Byron Lee; Steinert, Daniel Marion; and McGonigal, Charles, 4,075,299, Cl. 264-25.000.
Cochran, Thomas E., to Caterpillar Tractor Co. Compactor wheel with cross-shaped tips. 4,074,942, Cl. 404-121.000.
Cockcroft, Frederick Edward, to Hepworth & Grandage Ltd. Pistons for internal combustion engines or for compressors. 4,074,617, Cl. 92-228.000.
Cohen, Merrill. Plant plug. 4,074,997, Cl. 71-24.000.
Colanzi, Franco, to RIV - SKF Officine de Villar Perosa S.p.A. Electrically controlled window regulator. 4,074,463, Cl. 49-352.000.
Colbachini, Daciano; and Chiarotto, Romeo. Vehicle-borne inspection and maintenance apparatus. 4,074,790, Cl. 182-63.000.
Colburn, Richard P., to Westinghouse Electric Corporation. Method for removing fission products from a nuclear reactor coolant. 4,075,060, Cl. 176-37.000.
Cole, Carroll Richard, to Caterpillar Tractor Co. Motor grader support structure and side shift mechanism. 4,074,767, Cl. 172-781.000.
Colgate-Palmolive Company: *See*—
Cordon, Martin, 4,075,316, Cl. 424-49.000.
Mitchell, Robert Lee; and Chung, William John, 4,075,317, Cl. 424-52.000.
Schaar, Charles H., 4,074,716, Cl. 128-287.000.
Colgate, Stirling A. Blasting agent and method. 4,074,629, Cl. 102-23.000.

Collins, Jack: *See—*
Grossman, Leroy W.; Collins, Jack; and Kohls, E. Eugene, 4,074,379, Cl. 9-1.600.
Collins, William J. Molten metal sampler. 4,074,578, Cl. 73-425.40R.
Colour-Chem Ltd.: *See—*
Gleinig, Harald E. K., 4,075,198, Cl. 260-161.000.
Coltrin, George E., to Adams & Coltrin, Inc. Fence. 4,074,893, Cl. 256-21.000.
Combette, Marc; and Ollivier, Jean. Device for maintaining in position the piston of a fastener tool. 4,074,845, Cl. 227-10.000.
Combette, Marc: *See—*
Ollivier, Jean; and Combette, Marc, 4,074,842, Cl. 227-8.000.
Combustion Engineering, Inc.: *See—*
Bruno, Stephen James; Dunn, Stephen Alfred; and Raber, Marvin, 4,075,059, Cl. 176-22.000.
Cooper, David Eugene; Hendee, Leon Clyde, III; Hill, Walter Guy, Jr.; Leshem, Adam; and Marugg, Martin Lewis, 4,074,814, Cl. 214-1.0BB.
Ferrin, Charles Robert, 4,075,102, Cl. 210-277.000.
Hochmuth, Frank William, 4,074,708, Cl. 126-360.00A.
Noyes, Richard Croissant, 4,075,058, Cl. 176-21.000.
Comer, William T.: *See—*
Kreighbaum, William E.; and Comer, William T., 4,075,344, Cl. 424-258.000.
Commissariat a l'Energie Atomique: *See—*
de Cosnac, Bertrand; and Spiwack, Alain, 4,075,658, Cl. 358-96.000.
Communications Patents Limited: *See—*
Baker, Henry Louis, 4,075,422, Cl. 178-23.00R.
Compagnie Generale de Radiologie: *See—*
Grubis, Bernard, 4,075,526, Cl. 313-56.000.
Compo Industries, Inc.: *See—*
Kaplan, Martin; and Tassone, Joseph V., 4,074,383, Cl. 12-145.000.
Concannon, Thomas P., to Du Pont de Nemours, E. I., and Company. Method for providing heated fuser roll with improved release and wear life. 4,075,362, Cl. 427-22.000.
Consonni, Pietro: *See—*
Omodei-Sale, Amedeo; Consonni, Pietro; and Lerner, Leonard, 4,075,341, Cl. 424-258.000.
Constien, Vernon G.: *See—*
Copeland, Claude T.; and Constien, Vernon G., 4,074,760, Cl. 166-276.000.
Construction Innovations, Inc.: *See—*
Behn, Frederick H., 4,074,897, Cl. 269-43.000.
Continental Group, Inc., The: *See—*
Pelton, Peter G.; Grubman, Alan A.; and Hasegawa, Gary, 4,075,099, Cl. 210-168.000.
Continental Oil Company: *See—*
Gorin, Everett, 4,075,080, Cl. 208-8.000.
Cooke, Claude E., Jr., to Exxon Production Research Company. Apparatus and method for well repair operations. 4,074,756, Cl. 166-253.000.
Cooke, Robert William: *See—*
Kosalos, James George; and Cooke, Robert William, 4,075,599, Cl. 340-3.00R.
Cooper, David Eugene; Hendee, Leon Clyde, III; Hill, Walter Guy, Jr.; Leshem, Adam; and Marugg, Martin Lewis, to Combustion Engineering, Inc. Method and apparatus for controlling surface traversing device. 4,074,814, Cl. 214-1.0BB.
Cooper, Joseph E.: *See—*
Brzozowski, Stanley F.; and Cooper, Joseph E., 4,074,989, Cl. 65-27.000.
Brzozowski, Stanley F.; and Cooper, Joseph E., 4,074,990, Cl. 65-27.000.
Brzozowski, Stanley F.; and Cooper, Joseph E., 4,074,991, Cl. 65-27.000.
Coors Container Company: *See—*
McMillin, Danny Leon; and Dugan, Larry Mason, 4,074,809, Cl. 209-75.000.
Copal Company Limited: *See—*
Inoue, Nobuyoshi; and Shimizu, Munetaka, 4,075,648, Cl. 354-238.000.
Copeland, Claude T.; and Constien, Vernon G., to Dow Chemical Company, The. Method for forming a consolidated gravel pack. 4,074,760, Cl. 166-276.000.
Cor, Bertrand: *See—*
Cailliot, Serge Leon Louis, 4,074,621, Cl. 99-286.000.
Corbett, William H.: *See—*
Lewis, Kim R.; and Corbett, William H., 4,074,797, Cl. 197-1.00R.
Cordell, Carl R., Jr. Fishing lure. 4,074,454, Cl. 43-42.280.
Cordon, Martin, to Colgate-Palmolive Company. Dentifrices. 4,075,316, Cl. 424-49.000.
Cornellier, Joseph Rene: *See—*
Kwok, Clyde Chi Kai; and Cornellier, Joseph Rene, 4,074,727, Cl. 139-435.000.
Corning Glass Works: *See—*
Ackerman, Roger G.; and Karstetter, Bruce R., 4,074,993, Cl. 65-30.00E.
Armistead, William H., 4,075,024, Cl. 106-53.000.
Cunningham, George M., 4,075,270, Cl. 264-209.000.
Voss, Raymond O., 4,074,992, Cl. 65-30.00E.
Cory, Halsey W., to Force Control Industries, Inc. Internal combustion engine and cooling fan drive system. 4,074,663, Cl. 123-41.120.
Cousins, Morison S.: *See—*
Steiner, Fred S.; and Cousins, Morison S., 4,075,105, Cl. 210-477.000.
Coval, Arthur B.: *See—*
Lee, Arthur L.; and Coval, Arthur B., 4,074,784, Cl. 180-24.000.
Covington, Wayne F.: *See—*
Christopher, Chris J.; Wenninger, Fred W.; Morris, Donald E.; Covington, Wayne F.; Folsom, Jerry B.; Beyers, Joseph W.; Nairn, John H.; and Osborne, Jeffrey C., 4,075,679, Cl. 364-200.000.
Crandall, Richard Seely; and Faughnan, Brian Wilfred, to RCA Corporation. Method of storing optical information. 4,075,610, Cl. 365-107.000.
Credit Industry Associates, Inc.: *See—*
Jarm, Robert L., 4,074,410, Cl. 29-265.000.
Cristiani, Franco: *See—*
Bellasio, Elvio; and Cristiani, Franco, 4,075,241, Cl. 560-73.000.
Cristy, Nicholas G. Floor support arrangement. 4,074,474, Cl. 52-2.000.
Crompton & Knowles Corporation: *See—*
Roberson, James H., 4,074,546, Cl. 68-205.00R.
Crounse, Nathan Norman; and Schmidt, Paul Joseph, to Sterling Drug Inc. 3,5-Bis (indolyl)-5-(indolyl)-2(5H)-furanones. 4,075,224, Cl. 260-326.14R.
Cryder, John R.: *See—*
Adams, Stanley B.; Carbaugh, Frederick A.; and Cryder, John R., 4,074,690, Cl. 137-344.000.
Cumming, Edward P., to Robertshaw Controls Company. Control unit having an adjustable differential and method of making the same. 4,074,588, Cl. 74-522.000.
Cummings, Harold R., to General Electric Company. X-ray detector. 4,075,527, Cl. 313-93.000.
Cumpston, Edward H., Jr. Mortars and concretes containing pretreated aggregate fillers. 4,075,026, Cl. 106-97.000.
Cunningham, George M., to Corning Glass Works. Extrusion die mask. 4,075,270, Cl. 264-209.000.
Cunningham, Richard I.; and Day, Daniel E., to Lenmar Industries, Inc. Safety device for a fork-lift equipped refuse vehicle. 4,074,787, Cl. 180-82.00B.
Curry, Harold George; Attwood, Brian William; and White, Derek Graham Walter, to Karl Kroyer St. Anne's Limited. Apparatus for forming multi-ply fibrous sheets. 4,074,959, Cl. 425-81.100.
Curtis, James David, to Curtis, James David. Interfitting game board and playing pieces. 4,074,907, Cl. 273-282.000.
Custer, Peter Anderson. Motion picture film, soundtrack and method for production thereof. 4,075,018, Cl. 96-39.000.
Custom Rolled Corrugated Metals Co.: *See—*
Daniels, Lawrence H.; Hood, Murray C.; and Burdzinski, Boguslaw, 4,074,487, Cl. 52-236.300.
Cutler-Hammer, Inc.: *See—*
Calviello, Joseph A., 4,075,650, Cl. 357-15.000.
Cypro Corporation: *See—*
Gillespie, Robert M.; and Ricks, John R., 4,074,808, Cl. 209-73.000.
Dai Nippon Printing Co., Ltd.: *See—*
Takamizawa, Minoru; Yamamoto, Yasushi; Inoue, Yoshio; Noshiro, Atsumi; and Fujii, Hitoshi, 4,075,167, Cl. 260-46.50E.
Dailey, Donald E., to Arkla Industries, Inc. Cooking device. 4,074,675, Cl. 126-41.00R.
Dakss, Mark L.: *See—*
Fulenwider, John E.; Belmonte, Carl; and Dakss, Mark L., 4,074,840, Cl. 225-96.500.
D'Alelio, Gaetano F., to University of Notre Dame du Lac. Process for preparing aromatic polyimides and some polyimides prepared thereby. 4,075,171, Cl. 260-47.0CP.
Daley, Patrick J.: *See—*
Smits, Donald M.; Daley, Patrick J.; and Akerley, Arnold J., 4,074,721, Cl. 128-461.000.
Dall, Arthur G.; and Morgan, Donald L., to North American Products Corporation. Rotary cutter for agglomerated foam plastic. 4,074,594, Cl. 76-101.00A.
Daly, George W.; and Rucker, Joseph R., to Mastermount Corporation. Speaker mounting system. 4,074,883, Cl. 248-286.000.
D'Amico, John J., to Monsanto Company. Certain benzothiazolin-2-one derivatives. 4,075,216, Cl. 260-294.80C.
Damjanovic, Aleksandar: *See—*
Ward, Anthony T.; Damjanovic, Aleksandar; and Hair, Michael L., 4,075,013, Cl. 96-1.50R.
Daniels, Lawrence H.; Hood, Murray C.; and Burdzinski, Boguslaw, to Kaiser Steel Corporation; and Custom Rolled Corrugated Metals Co. Multi-story wall framing system and method. 4,074,487, Cl. 52-236.300.
D'Arcangelis, Timothy, to CATV Components Co. Co-channel interference suppression apparatus. 4,075,566, Cl. 325-369.000.
Darlington, William B.: *See—*
Du Bois, Donald W.; and Darlington, William B., 4,075,070, Cl. 204-129.000.
Dart Industries, Inc.: *See—*
Kiss, Kornel Dezso, 4,075,146, Cl. 260-23.00H.
Das, Dilip K., to Raytheon Company. Samarium-cobalt magnet with grain growth inhibited $SmCo_5$ crystals. 4,075,042, Cl. 148-103.000.
Das, Suryya K.: *See—*
Jozwiak, Edward L., Jr.; and Das, Suryya K., 4,075,135, Cl. 260-29.7DP.
Data General Corporation: *See—*
Sorensen, Karsten; Bernstein, David H.; and Druke, Michael B., 4,075,692, Cl. 364-200.000.
Dauben, Dwight L.: *See—*
Felber, Betty J.; Dauben, Dwight L.; and Marrs, Richard E., 4,074,757, Cl. 166-261.000.

Davidson, Allen Loy; and Wanat, Ronald Joseph, to Motorola, Inc. Stripline quadrature coupler. 4,075,581, Cl. 333-10.000.
Davidsson, Sven; Christensson, Nils Bertil; and Axelsson, Per Hugo, to AB Akerlund & Rausing. Blank for forming a receptacle having opposite handles. 4,074,849, Cl. 229-1.50B.
Davies, David C., to National Semiconductor Corporation. Electronic calculating apparatus and wallet enclosure. 4,075,702, Cl. 364-705.000.
Davies, Thomas J., Jr., to Fairchild Camera and Instrument Corporation. Incrementer/decrementer circuit. 4,075,464, Cl. 235-92.0EV.
Davis, Burns; and Petke, Frederick David, to Eastman Kodak Company. Polyesters containing a critical range of 1,4-cyclohexanedicarboxylic acid. 4,075,180, Cl. 260-75.00R.
Davis, Dalton M., to FDI, Inc. Method for making vehicle wheel assembly. 4,074,408, Cl. 29-159.010.
Davis, John Stephen; Larson, Kenneth Norman; and Phalen, Frank William, to Bunker Ramo Corporation. Communication control unit. 4,075,691, Cl. 364-200.000.
Davis, Mary Evelyn. Portable open fireplace blowing appliance. 4,074,863, Cl. 239-589.000.
Davis, Michael W.: *See*—
Simpson, Harold G.; and Davis, Michael W., 4,074,492, Cl. 52-419.000.
Davis, Warren C., to Raytheon Company. Tube with terminal end cap. 4,075,415, Cl. 174-50.520.
Davy, David Larry, Sr., to B. F. Goodrich Company, The. Wheel speed sensor. 4,075,520, Cl. 310-168.000.
Day, Daniel E.: *See*—
Cunningham, Richard I.; and Day, Daniel E., 4,074,787, Cl. 180-82.00B.
Day, William A.: *See*—
Archer, Robert A.; and Day, William A., 4,075,230, Cl. 260-345.300.
Dayton Sure-Grip & Shore Company, The: *See*—
Mess, Richard C., 4,074,499, Cl. 52-705.000.
Deazley, William R.: *See*—
Beilman, John L.; and Deazley, William R., 4,074,570, Cl. 73-182.000.
De Beau, Gerard Anthony; and Price, Harold Arnold, to Union Oil Company of California. Liquid delivery system. 4,074,734, Cl. 141-44.000.
de Blic, Emmanuel: *See*—
Boudet, Georges; Charpentier, Jacques; Vinel, Rene; Desmoulins, Jean-Claude; and de Blic, Emmanuel, 4,074,890, Cl. 254-29.00A.
DeBoer, Harold M.: *See*—
Jorgenson, Clyde R.; DeBoer, Harold M.; and Jorgenson, Ronald M., 4,075,374, Cl. 427-355.000.
Debourge, Jean-Claude: *See*—
Thizy, Andre; Pillon, Daniel; Debourge, Jean-Claude; and Lacroix, Guy, 4,075,324, Cl. 424-128.000.
de Cosnac, Bertrand; and Spiwack, Alain, to Commissariat a l'Energie Atomique. Method and device for isolating figures in an image. 4,075,658, Cl. 358-96.000.
Deena Packaging Industries, Inc.: *See*—
Ardito, Gerald J., 4,074,806, Cl. 206-531.000.
Deever, William R.: *See*—
Fuller, Matthew H.; and Deever, William R., 4,075,101, Cl. 210-275.000.
De Felice, Stephen L. Method of improving the myocardial function by the administration of carnitine. 4,075,352, Cl. 424-319.000.
de Feudis, Sergio, to AB Svenska Flaktfabriken. Device for emptying waste material from waste-storage containers. 4,074,921, Cl. 302-39.000.
Degasperi, Mario Marco, to Tasco S.p.A. Method and apparatus for real time image recognition. 4,075,604, Cl. 340-146.3AG.
Dehn, Joseph W., Jr.: *See*—
Lipowski, Stanley A.; Dehn, Joseph W., Jr.; and Retzsch, Clinton E., 4,074,968, Cl. 8-94.220.
Del Norte Technology, Inc.: *See*—
Parker, William H.; and Hart, Lawrence, 4,074,762, Cl. 166-315.000.
Delaney, Richard D. Sailing rig having camber adjustments. 4,074,647, Cl. 114-102.000.
Delle-Alsthom S.A.: *See*—
Thuries, Edmond, 4,075,673, Cl. 361-10.000.
DeMag Aktiengesellschaft: *See*—
Varwig, Karlheinz, 4,074,815, Cl. 214-1.0QG.
DeMarinis, Robert M., to SmithKline Corporation. Substituted acetamidocephalosporins. 4,075,338, Cl. 424-246.000.
DeMichele, Ernest: *See*—
Roberts, Charles; and DeMichele, Ernest, 4,074,670, Cl. 123-119.00E.
Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Horiie, Shigeki; Asai, Shin-Ichiro; Torikoshi, Takashi; Shirakawa, Kazuhiro; and Handa, Minoru, 4,075,253, Cl. 260-665.00R.
Denney, Jerry W., to American Monitor Corporation. Urea assay. 4,074,972, Cl. 23-230.00B.
Denzel, Horst; and Hahmann, Otto, to Chemische Werke Huels Aktiengesellschaft. Heat sealable polybutene-1 blends containing polypropylene or ethylene copolymer. 4,075,290, Cl. 260-897.00A.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Pyrazolo[1,5-a]pyrido[4,3-d]pyrimidin-9(4H)-one and derivatives thereof. 4,075,210, Cl. 260-256.40F.
Depp, Steven W.: *See*—
Baldwin, Howard A.; Depp, Steven W.; Koelle, Alfred R.; and Freyman, Robert W., 4,075,632, Cl. 343-6.80R.
Dermatologics for Veterinary Medicine, Inc.: *See*—
Mandy, Stephen H.; and Thompson, William D., 4,075,353, Cl. 424-338.000.
Desanti, Etiennette Romani. Electronic door announcer. 4,075,659, Cl. 358-108.000.
Deshich, Dushan C.; Chmela, Frank P.; and Kufner, Kenneth L., to Molex Incorporated. Crimping and wire lead insertion machine. 4,074,424, Cl. 29-753.000.
Desmoulins, Jean-Claude: *See*—
Boudet, Georges; Charpentier, Jacques; Vinel, Rene; Desmoulins, Jean-Claude; and de Blic, Emmanuel, 4,074,890, Cl. 254-29.00A.
DeSoto, Inc.: *See*—
Leo, Angelo Frank, 4,075,153, Cl. 260-37.0EP.
Packer, Eugene S.; and England, George J., 4,075,366, Cl. 427-44.000.
Sekmakas, Kazys; and Shah, Raj, 4,075,133, Cl. 260-29.300.
De Winter, Walter Frans: *See*—
Priem, Jan Josef; and De Winter, Walter Frans, 4,075,023, Cl. 96-114.000.
Dexter, Martin: *See*—
Spivack, John D.; and Dexter, Martin, 4,075,161, Cl. 260-45.80A.
Diamond, Julius, to William H. Rorer, Inc. Ethynylbenzene compounds and derivatives thereof for treating pain fever and inflammation. 4,075,354, Cl. 424-356.000.
Diamond Shamrock Corporation: *See*—
Lipowski, Stanley A.; Dehn, Joseph W., Jr.; and Retzsch, Clinton E., 4,074,968, Cl. 8-94.220.
Di Chiara, Anthony J. Walker with tray. 4,074,683, Cl. 135-67.000.
Dick, Wesley Marion, to Borg-Warner Corporation. Combined torque proportioning and reduction drive assembly. 4,074,591, Cl. 74-674.000.
Dickstein, Jack, to Haven Industries, Inc. Vinyl-polymerizable surfactive monomers. 4,075,411, Cl. 560-224.000.
Diez de Aux, Alphonzo. Snow skiing simulation apparatus. 4,074,903, Cl. 272-16.000.
DiGiacomo, Hector L.; and Sacco, John A., to General Battery Corporation. System and apparatus for assembling industrial lead-acid storage batteries. 4,074,423, Cl. 29-730.000.
Dillard, George M., to United States of America, Navy. Recursive filter mean-level detector. 4,075,703, Cl. 364-715.000.
Dockray, Edward; and Killen, Denis, to Unifoam A.G. Manufacture of polymeric foam. 4,074,960, Cl. 425-89.000.
Dr. -Ing. Rudolf Hell GmbH: *See*—
Gall, Winrich, 4,075,662, Cl. 358-280.000.
Wellendorf, Klaus, 4,075,663, Cl. 358-283.000.
Dr. Johannes Heidenhain GmbH: *See*—
Kraus, Heinz, 4,075,497, Cl. 250-505.000.
Dodd, Gilbert E. Apparatus for mixing medication with water supply. 4,074,685, Cl. 137-101.110.
Doelp, Louis C.; Friedman, Lee; and Mitchell, Maurice M., to Air Products and Chemicals, Inc. Process for hydrodesulfurization and liquefaction of carbonaceous stocks using suspended catalyst. 4,075,082, Cl. 208-10.000.
Dolenc, Anton: *See*—
Biornstad, Peter; and Dolenc, Anton, 4,074,624, Cl. 100-35.000.
Dolhyj, Serge R.; Milberger, Ernest C.; and White, James F., to Standard Oil Company, The. Process for preparing phthalic anhydride. 4,075,231, Cl. 260-346.400.
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Domtar Limited: *See*—
Marshall, Harry Borden; and Vincent, Donald L., 4,075,248, Cl. 260-600.00R.
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Skubic, Leroy F.; Donkle, Lucius B., Jr.; and Groth, Donald L., 4,074,812, Cl. 211-192.000.
Donnan, Harold: *See*—
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Donze, Jean-Marie; and Vuffray, Georges, to Girard-Perregaux S.A. Electronic display device. 4,074,513, Cl. 58-4.00A.
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Yarwood, John C.; Dore, James E.; and Preuss, Robert K., 4,075,303, Cl. 264-44.000.

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Copeland, Claude T.; and Constien, Vernon G., 4,074,760, Cl. 166-276.000.
Garner, Joseph L., 4,075,138, Cl. 260-2.50B.
Greenawalt, Eddie Lee; and Geren, Lorenzo Dow, 4,074,504, Cl. 53-22.00A.
Hay, Robert A., II, 4,075,264, Cl. 264-46.500.
Meyer, Victor E., 4,075,394, Cl. 428-537.000.
Morehouse, Donald S., Jr.; Bolton, Frank H., deceased; and Bolton, Kathryn M., administratrix, 4,075,134, Cl. 260-29.6RW.
Olstowski, Franciszek, 4,075,151, Cl. 260-33.20R.
Tong, Yulan C., 4,075,207, Cl. 260-250.0BC.
Vrieland, G. Edwin; and Friedli, Hans R., 4,075,122, Cl. 252-437.000.
Wilson, Charles A.; and Mixan, Craig E., 4,075,204, Cl. 260-250.0BC.
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Drake, Bascom A. Roofing mop. 4,074,386, Cl. 15-229.00R.

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Du Bois, Donald W.; and Darlington, William B., to PPG Industries, Inc. Electrode material. 4,075,070, Cl. 204-129.000.

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Ducep, Jean Bernard; Farge, Daniel; Ponsinet, Gerard; and Reisdorf, Daniel, to Rhone-Poulenc Industries. Naphthacene derivatives. 4,075,328, Cl. 424-180.000.

Duffin, Bryan, to Lever Brothers Company. Fabric treatment compositions. 4,075,110, Cl. 252-8.800.

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Duncan, Robert; and Barna, Richard P., to Westinghouse Electric Corporation. Process and apparatus for sealing nuclear reactor fuel. 4,075,454, Cl. 219-137.00R.

Dunham, Philip N.; Tillyer, John N.; and Martin, Armand. Charcoal briquet system. 4,074,977, Cl. 44-38.000.

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Anton, Anthony; and Nolin, Joseph Arthur Benoit, 4,075,378, Cl. 428-97.000.
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Dyckman, Edward J.; Andersen, Deborah M.; and Fischer, Eugene C., to United States of America, Navy. Low leaching antifouling organometallic polyvinyls. 4,075,319, Cl. 424-78.000.

Dydyk, Michael, to Motorola, Inc. Accumulating cavity microwave oscillator. 4,075,578, Cl. 331-56.000.

Dyjak, Richard C., to United States of America, Navy. Expendable light-weight minesweeping cutter. 4,074,650, Cl. 114-221.00A.

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E. R. Squibb & Sons, Inc.: *See—*
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Earth Sciences, Inc.: *See—*
Loest, Kent W.; and Schaefer, John T., 4,075,068, Cl. 204-93.000.

East/West Industries, Inc.: *See—*
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Foster, Charles H., 4,075,226, Cl. 260-327.0TH.
Goffe, Charles A., deceased; and Heseltine, Donald W., 4,075,017, Cl. 96-48.0HD.
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,075,162, Cl. 260-45.8NZ.
Irick, Gether, Jr.; and Kelly, Charles A., 4,075,220, Cl. 260-308.00B.
Morie, Gerald P.; and Sloan, Cephas H., 4,074,724, Cl. 131-267.000.

Easton, Harlan J. Feed mixer. 4,075,713, Cl. 366-192.000.

Eck, Norbert Otto; Stark, Siegfried Alfons; and Wieland, Erich Georg, to Koenig & Bauer Aktiengesellschaft. Apparatus for preventing non-uniform application of ink. 4,074,627, Cl. 101-425.000.

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Eckles, William Edward; and Canaris, Valerie, to R. O. Hull & Company, Inc. Electroplating zinc, ammonia-free acid zinc plating bath therefor and additive composition therefor. 4,075,066, Cl. 204-55.00R.

Economy, James; Jun, Choll K.; and Lin, Ruey Y., to Carborundum Company, The. Boron nitride-boron nitride composites. 4,075,276, Cl. 264-332.000.

Eden, Richard C., to Rockwell International Corporation. Sensitive high speed solid state preamp. 4,075,576, Cl. 330-277.000.

Edgewater Marine, Inc.: *See—*
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Educational Electronics of California Inc.: *See—*
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Edwards, Laroy H., to Chevron Research Company. Fungicidal 5-dialkylamino-4-nitrosulfonamidothiophenes. 4,075,347, Cl. 424-275.000.

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Beck, James Richard; and Gajewski, Robert Peter, 4,075,003, Cl. 71-92.000.
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Plasko, Emil Robert, 4,075,596, Cl. 337-408.000.
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Engel, Werner. Automatically operating casting ladle apparatus. 4,074,837, Cl. 222-629.000.
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Eppler, William G., Jr., to VSC Company, The. Method and apparatus for automatic dictation playback control. 4,075,435, Cl. 179-100.1VC.
Erco Industries Limited: *See*—
Rapson, W. Howard; Fredette, Maurice C. J.; and Meyers, Norman W., 4,075,308, Cl. 423-478.000.
Ericsson, Ernst Enoch, to Telefonaktiebolaget L M Ericsson. Apparatus in connection with a computer memory for enabling transportation of an empty memory field from one side to the other of an adjacent data field while the computer is operative. 4,075,694, Cl. 364-200.000.
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Essel, Alain Jacques: *See*—
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Essex Group, Inc.: *See*—
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Essex International, Inc.: *See*—
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Estes, Kenneth K. Cooling fan control. 4,074,662, Cl. 123-41.120.
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Eustacchio, Peter, to Veitscher Magnesitwerke-Actien-Gesellschaft. Process for preparing granulated magnesium hydroxide and magnesia of a large specific surface. 4,075,311, Cl. 423-636.000.
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Jaeger, Frederick T., 4,075,376, Cl. 428-36.000.
Jaeger, Frederick T., 4,075,392, Cl. 428-457.000.
Patel, Mahesh S., 4,075,371, Cl. 427-224.000.
Evolution SA: *See*—
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Zondag, Nicolaas Abraham, 4,074,630, Cl. 102-24.00R.
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Christian, Lawrence D., 4,074,754, Cl. 166-245.000.
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Lang, Robert J., 4,075,079, Cl. 208-8.000.
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Oswald, Alexis A.; and Valint, Paul L., Jr., 4,075,332, Cl. 424-216.000.
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F. Garofalo Electric Co., Inc.: *See*—
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Glikman, Mark Leonovich; Sapunar, Zakhar Isaevich; Avrus, Albert Vladimirovich; Gorokhovsky, Vladilen Alexandrovich; Fainberg, Evgeny Borisovich; Ivanov, Vladimir Alexandrovich; Shirkevich, Tatyana Leonidovna; and Sizov, Vadim Mikhailovich, 4,074,994, Cl. 65-44.000.
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Falk, John Carl, to Borg-Warner Corporation. Chlorinated, hydrogenated polybutadiene impact modifiers for PVC. 4,075,289, Cl. 260-890.000.
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Davis, Dalton M., 4,074,408, Cl. 29-159.010.
Feather Kogyo Kabushiki Kaisha: *See*—
Sugiyama, Tsuneyoshi, 4,074,430, Cl. 30-260.000.
Federico, Arthur. Pastry serving implement. 4,074,917, Cl. 294-7.000.
Feigin, Robert, to Sybron Corporation. Dyeing of synthetic fibers with cationic dyes in the presence of cationic assistants containing hydroxyl and cyclic moieties. 4,074,970, Cl. 8-169.000.
Felber, Betty J.; Dauben, Dwight L.; and Marrs, Richard E., to Standard Oil Company (Indiana). Method using lignosulfonates for high-temperature plugging. 4,074,757, Cl. 166-261.000.
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Feliks, James J., to Mead Corporation, The. Heading machine. 4,074,619, Cl. 93-55.10R.
Fender, C. Leo. Musical instrument truss rod assembly. 4,074,606, Cl. 84-293.000.
Ferraro, Charles F.; Javick, Richard A.; and Robertson, James A., to FMC Corporation. Method of coating with water dispersible, low molecular weight polyamide resin particles of uniform sizes. 4,075,369, Cl. 427-185.000.
Ferrin, Charles Robert, to Combustion Engineering, Inc. Liquid processing media bed drain system. 4,075,102, Cl. 210-277.000.
Ferro Corporation: *See*—
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Filak, Andrew M. Multi-level knock-down framework structure for supporting a plurality of objects. 4,074,811, Cl. 211-191.000.
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Fischer, Artur. Composite plate. 4,074,496, Cl. 52-622.000.
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Fischer, John Joseph, to International Nickel Company, Inc., The. Dispersion strengthened ferritic alloy for use in liquid-metal fast breeder reactors (LMFBRS). 4,075,010, Cl. 75-235.000.
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Fishing Tools, Inc.: *See*—
Lee, William T., 4,074,775, Cl. 173-79.000.
Fisler, Charles F., to General Electric Company. Emitter follower voltage controlled power supply. 4,075,685, Cl. 363-44.000.
Fitton, Robert Charles; and Fiore, Barbara Ann, to J. M. Huber Corporation. Preparation of improved zeolites. 4,075,280, Cl. 423-118.000.
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Fleming, Ian D.; Turner, Michael K.; and Brewer, Stephen J., to Glaxo Laboratories Limited. Method for producing cephalosporins. 4,075,061, Cl. 195-29.000.

Flint, John R., to Bell & Howell Company. Dual function probe. 4,074,853, Cl. 235-477.000.
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Florer, James W., to Ciba-Geigy Corporation. Method and apparatus for making pressure plugs in cables or cable stubs with continuous air flow. 4,075,267, Cl. 264-94.000.
Flournoy, Norman E., to Texaco Inc. Combined pipeline marker and test unit. 4,075,601, Cl. 340-15.000.
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Ferraro, Charles F.; Javick, Richard A.; and Robertson, James A., 4,075,369, Cl. 427-185.000.
Gibbons, Loren Kenneth, 4,075,001, Cl. 71-90.000.
Lee, Arthur L.; and Coval, Arthur B., 4,074,784, Cl. 180-24.000.
Foldes, Stephen. Bobbin construction for electrical coils. 4,075,590, Cl. 336-192.000.
Folsom, Gary J.; and Kaisler, Francis J., to United States of America, Air Force. Coaxial optical system. 4,074,930, Cl. 350-33.000.
Folsom, Gary J.: *See*—
Wells, H. David; Folsom, Gary J.; and Kaisler, Francis J., 4,074,964, Cl. 8-10.200.
Folsom, Jerry B.: *See*—
Christopher, Chris J.; Wenninger, Fred W.; Morris, Donald E.; Covington, Wayne F.; Folsom, Jerry B.; Beyers, Joseph W.; Nairn, John H.; and Osborne, Jeffrey C., 4,075,679, Cl. 364-200.000.
Force Control Industries, Inc.: *See*—
Cory, Halsey W., 4,074,663, Cl. 123-41.120.
Ford Motor Company: *See*—
Stockton, Thomas R., 4,074,533, Cl. 60-620.000.
Foreman, Kenneth M.: *See*—
Oman, Richard A.; and Foreman, Kenneth M., 4,075,500, Cl. 290-55.000.
Foss, Robert Paul, to Du Pont de Nemours, E. I., and Company. Preparation of photosensitive polyaldehydes. 4,075,175, Cl. 260-67.00R.
Foster, Alan W.; and Besozzi, Alfio J., to Petro-Tex Chemical Corporation. Purification of unsaturated compounds. 4,075,256, Cl. 260-680.00E.
Foster, Charles H., to Eastman Kodak Company. Secondary antioxidants. 4,075,226, Cl. 260-327.0TH.
Fostick, Moshe A.: *See*—
Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 4,075,481, Cl. 250-343.000.
Fox, Joel Lawrence; and Marquardt, Eugene Everett, to International Business Machines Corporation. Configuration and control unit for a heterogeneous multi-system. 4,075,693, Cl. 364-200.000.
Fradenburgh, Evan A.; and Yarm, Jay M., to United Technologies Corporation. Locking control and overtravel safety stop system for variable length rotor blades. 4,074,952, Cl. 416-87.000.
Frahm, Carl E.; and Frahm, Shirley E. Valved water container with seal. 4,074,986, Cl. 55-502.000.
Frahm, Shirley E.: *See*—
Frahm, Carl E.; and Frahm, Shirley E., 4,074,986, Cl. 55-502.000.
Francis, Robert W.; and Newman, Gerald H., to Exxon Research & Engineering Co. Cell having chalcogenide cathode and solvated alkali metal salt electrolyte. 4,075,397, Cl. 429-50.000.
Frank, Robert G., to PPG Industries, Inc. Method of shaping glass sheets by the roll forming method. 4,074,995, Cl. 65-104.000.
Franklin Manufacturing Company: *See*—
Case, Richard P., 4,074,545, Cl. 68-12.00R.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef, 4,074,631, Cl. 104-12.000.
Franzolini, Luciano, to GL.GE. Apparecchiature Elettroniche Industriali S.p.A. Device for detecting differences in angular positions of two shafts rotating in opposite directions. 4,074,579, Cl. 73-507.000.
Fratturo, Jules P., to Textube Corporation. Textile carrier. 4,074,875, Cl. 242-118.300.
Fredette, Maurice C. J.: *See*—
Rapson, W. Howard; Fredette, Maurice C. J.; and Meyers, Norman W., 4,075,308, Cl. 423-478.000.
Freed, Gerald L.: *See*—
Schneider, Richard A.; Freed, Gerald L.; and Lipnick, Richard, 4,075,699, Cl. 364-492.000.
Freitag, Dieter: *See*—
Schmidt, Manfred; Freitag, Dieter; and Nouvertne, Werner, 4,075,119, Cl. 252-182.000.
Frequency Technology, Inc.: *See*—
Wroblewski, Theodore, 4,075,547, Cl. 323-60.000.
Freyman, Robert W.: *See*—
Baldwin, Howard A.; Depp, Steven W.; Koelle, Alfred R.; and Freyman, Robert W., 4,075,632, Cl. 343-6.80R.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Frosch, Werner; and Uliczka, Wolfgang, 4,074,395, Cl. 19-163.000.
Fried Krupp Huttenwerke AG: *See*—
Koch, Heinz; Pawlowicz, Manfred; and Brams, Bernhard, 4,074,982, Cl. 51-92.00R.
Friedli, Hans R.: *See*—
Vrieland, G. Edwin; and Friedli, Hans R., 4,075,122, Cl. 252-437.000.
Friedman, Ben Joseph. Method and apparatus for constructing and grading objective examinations. 4,074,445, Cl. 35-48.00A.
Friedman, Henry: *See*—
Verge, John Pomfret; Neville, Martin Charles; and Friedman, Henry, 4,075,222, Cl. 548-336.000.
Friedman, Lee: *See*—
Doelp, Louis C.; Friedman, Lee; and Mitchell, Maurice M., 4,075,082, Cl. 208-10.000.
Frielinghaus, Klaus H.: *See*—
Clark, Gary E.; Frielinghaus, Klaus H.; and Smith, Barry L., 4,074,879, Cl. 246-37.000.
Frisbee, Claude M., to J. I. Case Company. Bulldozer blade control. 4,074,769, Cl. 172-804.000.
Frisbee, Claude M., to J. I. Case Company. Angle control for dozer blade. 4,074,770, Cl. 172-804.000.
Frisch, Kurt Charles; and Russell, Donald Henry, to Atlantic Richfield Company. Powder coating compositions based on a cyclic nitrile compound. 4,075,181, Cl. 260-77.50B.
Frisque, Alvin J.; and DuBrow, Paul L., to Nalco Chemical Company. Oil base paints containing water-soluble polymers. 4,075,144, Cl. 260-22.00R.
Fritts, David H. Over temperature battery deactivation system. 4,075,400, Cl. 429-62.000.
Fritz Eichenauer, Firma: *See*—
Lieber, Ludwig, 4,075,459, Cl. 219-375.000.
Frosch, Werner; and Uliczka, Wolfgang, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Web layering device. 4,074,395, Cl. 19-163.000.
Fuchs, Hermann; Kapaun, Gustav; and Meininger, Fritz, to Hoechst Aktiengesellschaft. Dyestuff preparations for dyeing and printing natural and synthetic polyamide fibre materials. 4,074,967, Cl. 8-54.000.
Fuchs, Julius Jakob, to Du Pont de Nemours, E. I., and Company. Bis carbamate derivatives of diazetidine diones. 4,075,201, Cl. 260-239.00A.
Fuel Research & Instrument Co.: *See*—
Brockschmidt, Willis H.; Brockschmidt, Robert W.; and Grabenhofer, John D., 4,074,561, Cl. 73-17.00R.
Fuhring, Heinrich, to Bowe Bohler & Weber Maschinenfabrik. Solvent-recovery system. 4,074,984, Cl. 55-163.000.
Fuji Photo Film Co., Ltd.: *See*—
Iwasa, Masakazu; Horikawa, Kazuo; and Matsumoto, Seiji, 4,075,011, Cl. 96-1.00R.
Munakata, Tsuneaki; and Kuboshima, Makoto, 4,075,645, Cl. 354-187.000.
Suzuki, Masaaki; and Kasuga, Akira, 4,075,384, Cl. 428-212.000.
Fuji Photo Optical Co., Ltd.: *See*—
Hosono, Tsutomu, 4,075,644, Cl. 354-173.000.
Fujii, Hitoshi: *See*—
Takamizawa, Minoru; Yamamoto, Yasushi; Inoue, Yoshio; Noshiro, Atsumi; and Fujii, Hitoshi, 4,075,167, Cl. 260-46.50E.
Fujikawa, Noboru: *See*—
Furuta, Tadaaki; Inagaki, Kenji; Mizoguchi, Yoshiyuki; Fujikawa, Noboru; and Kominami, Naoya, 4,075,100, Cl. 210-266.000.
Fujino, Takashi: *See*—
Murata, Moriyasu; Yamanaka, Makoto; and Fujino, Takashi, 4,075,129, Cl. 252-527.000.
Fujiwara, Mitsugu: *See*—
Aoki, Ren; Fujiwara, Mitsugu; and Wada, Tasaku, 4,075,664, Cl. 358-286.000.
Fujiyoshi, Kanji; Mizumura, Yutaka; and Sono, Junji, to Toyo Boseki Kabushiki Kaisha. Powder coating composition. 4,075,261, Cl. 260-850.000.
Fukuda, Hiroshi; and Kuzuo, Tooze, to Matsu Kyu Kabushiki Kaisha. Miniature slide switch assembly having flexible detent on movable actuator or fixed housing. 4,075,442, Cl. 200-16.00F.
Fulenwider, John E.; Belmonte, Carl; and Dakss, Mark L., to GTE Laboratories Incorporated. Hand-held tool for optical fiber waveguide end preparation. 4,074,840, Cl. 225-96.500.
Fuller, Matthew H.; and Deever, William R., to Texaco Inc. Apparatuses for fluidizing a filter media plug. 4,075,101, Cl. 210-275.000.
Funakoshi, Eisuke. Water film forming installation. 4,075,295, Cl. 261-36.00R.
Funk, Buddy Keith; and Tetrick, Elton Earl, to Sperry Rand Corporation. Keyboard overlay. 4,075,465, Cl. 235-145.00R.
Furuhama, Teruhide: *See*—
Koyama, Tsuneo; Sugiyama, Yuichi; Furuhama, Teruhide; Tajima, Yoshio; Kakiuchi, Hiroshi; Yamada, Kazuhiro; and Obara, Masaaki, 4,075,159, Cl. 260-42.470.
Furukawa, Yasuhiko; and Igarashi, Tsuyoshi, to Asahi Glass Company Ltd. Laminated glass windshield and method of making same. 4,075,381, Cl. 428-192.000.
Furukubo, Haruo; Takezi, Yasaburo; and Takatuka, Kenzi, to Japan Storage Battery Company Limited. High pressure sodium vapor lamp of unsaturated vapor pressure type. 4,075,530, Cl. 313-229.000.
Furuse, Mituhiro: *See*—
Ochiai, Tomoyoshi; Hayashi, Takeshi; and Furuse, Mituhiro, 4,075,697, Cl. 364-481.000.
Furuta, Tadaaki; Inagaki, Kenji; Mizoguchi, Yoshiyuki; Fujikawa, Noboru; and Kominami, Naoya, to Asahi Kasei Kogyo Kabushiki Kaisha. Dialysis unit and dialysis apparatus employing the dialysis unit. 4,075,100, Cl. 210-266.000.
Futagawa, Yoshikiyo; Kubota, Kanemitsu; and Kamakura, Hiroshi, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. Reference voltage circuit. 4,075,623, Cl. 340-347.0NT.
G.A.O. Gesellschaft fur Automation und Organisation mbH: *See*—
Pauli, Gunter; and Jahn, Gerhard, 4,075,507, Cl. 307-117.000.
G. D. Searle & Co.: *See*—
Mueller, Richard A., 4,075,407, Cl. 542-412.000.

Gajewski, Robert Peter: *See—*
Beck, James Richard; and Gajewski, Robert Peter, 4,075,003, Cl. 71-92.000.
Gale, Preston Lee; and Fair, Jack E., to Caterpillar Tractor Co. Aluminum piston with steel reinforced piston ring grooves. 4,074,616, Cl. 92-222.000.
Galetto, Louis Valentine; Meier, Johann Hans; Pimbley, Walter Thornton; and Wolfe, Bruce Allen, to International Business Machines Corporation. Bi-directional dot matrix printer with slant control. 4,075,636, Cl. 346-75.000.
Gall, Winrich, to Dr. -Ing. Rudolf Hell GmbH. Method and system for compensating the non-linearities in a reproduction process. 4,075,662, Cl. 358-280.000.
Gallacher, Lawrence V., to King Industries, Inc. Catalysis of amino resin cross-linking reactions with high molecular weight sulfonic acids. 4,075,176, Cl. 260-67.60R.
Galliani, Giulio: *See—*
Sale, Amedeo Omodie; Toia, Emilio; Galliani, Giulio; and Lerner, Leonard J., 4,075,342, Cl. 424-258.000.
Garbelman, David L.: *See—*
Jakob, Herbert E.; and Garbelman, David L., 4,075,710, Cl. 366-25.000.
Garcia, Beltran L., to Raymond Lee Organization, Inc., The, part interest to each. Freezer alarm. 4,075,615, Cl. 340-227.100.
Gardos, Michael N.: *See—*
Bilow, Norman; and Gardos, Michael N., 4,075,111, Cl. 252-12.000.
Garner, George H. Apparatus for lockably mounting picture frames and the like. 4,074,888, Cl. 248-475.00R.
Garner, Joseph L., to Dow Chemical Company, The. Polymerization process and vinylidene chloride microspheres produced thereby. 4,075,138, Cl. 260-2.50B.
Garofalo, Frank S., to F. Garofalo Electric Co., Inc. System for attaching pillow to X-ray table. 4,074,373, Cl. 5-325.000.
Garofano, Norman Rutledge: *See—*
Port, Eugene Baker; and Garofano, Norman Rutledge, 4,075,281, Cl. 423-206.00T.
Garrett, Charles Ronald, to American Hoist & Derrick Company. Swivel shackle. 4,074,519, Cl. 59-95.000.
Gastinne, Arnaud: *See—*
Cailliot, Serge Leon Louis, 4,074,621, Cl. 99-286.000.
Gastrock, William Henry; and Asato, Goro, to American Cyanamid Company. 1,3-Dithiolane compounds and method of preparation thereof. 4,075,228, Cl. 260-332.30P.
Gault, Terrell Wilson; and Maguire, Edward John, Jr., to Procter & Gamble Company, The. Liquid detergent compositions containing a self-emulsified silicone suds controlling agent. 4,075,118, Cl. 252-135.000.
Gebruder Ott A.G.: *See—*
Pato, Tibor, 4,075,355, Cl. 426-231.000.
Gee, Wilfred: *See—*
Gilbert, Joseph; McRobbie, Malcolm McKenzie; and Gee, Wilfred, 4,075,637, Cl. 346-153.000.
Geiger, Kenneth E., to Becton, Dickinson and Company. Syringe plunger. 4,074,715, Cl. 128-218.00P.
Geigy Chemical Corporation: *See—*
Kleiner, Eduard K.; and Knell, Martin, 4,075,237, Cl. 260-455.00R.
Gellert, Donald P. Process of and apparatus for solar heating and the like. 4,074,704, Cl. 126-270.000.
Gelotte, Karl O.; Zalay, Andrew W.; and Bell, Malcolm R., to Sterling Drug Inc. Conversion of 3-(pyridinyl)-2-cyclohexen-1-one to 3-(pyridinyl)anilines. 4,075,217, Cl. 260-296.00R.
Genequand, Pierre; and Joyeux, Didier, to Battelle Memorial Institute. Flat cathodic tube display. 4,075,535, Cl. 313-422.000.
General Battery Corporation: *See—*
DiGiacomo, Hector L.; and Sacco, John A., 4,074,423, Cl. 29-730.000.
General Cable Corporation: *See—*
Virkus, Kenneth J., 4,075,419, Cl. 174-107.000.
General Dynamics Corporation: *See—*
Hulderman, Garry N.; and Winderman, Jay B., 4,075,571, Cl. 329-104.000.
General Electric Company: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 4,075,038, Cl. 148-1.500.
Brown, Edgar D., Jr.; and Traver, Frank J., 4,075,115, Cl. 252-75.000.
Castonguay, Roger N.; and Jencks, Charles L., 4,075,584, Cl. 335-20.000.
Cummings, Harold R., 4,075,527, Cl. 313-93.000.
Fisler, Charles F., 4,075,685, Cl. 363-44.000.
Krulewich, Edward B., 4,074,987, Cl. 62-128.000.
Lijewski, Robert R.; and Wiesen, Ernest J., 4,075,485, Cl. 250-369.000.
Mark, Victor, 4,075,164, Cl. 260-45.70S.
McCullough, Charles R., 4,075,421, Cl. 174-120.0SC.
Olander, Walter Karl, 4,075,174, Cl. 260-47.0ET.
Piper, William W.; Prener, Jerome S.; and Gillooly, George R., 4,075,532, Cl. 313-497.000.
Plunkett, Allan Barr, 4,075,538, Cl. 318-52.000.
Razzano, John S., 4,075,169, Cl. 260-46.50R.
Stevens, Francis Joseph, 4,075,561, Cl. 324-149.000.
Tsen, Lo Kwang; and Palkiewicz, John Louis, 4,075,260, Cl. 260-830.0TW.
General Foods Corporation: *See—*
Haag, Robert A.; Rousseau, Patrick M.; and Martin, Thom O., 4,075,356, Cl. 426-285.000.
Szczesniak, Alina Surmacka; and Mao, Wei-Wen, 4,075,357, Cl. 426-332.000.
General Motors Corporation: *See—*
Hanson, Richard J., 4,075,477, Cl. 250-227.000.
Hoffman, Robert P., 4,075,522, Cl. 310-214.000.
Milton, Thomas J., 4,074,548, Cl. 70-1.500.
Schroeder, Thaddeus, 4,075,592, Cl. 337-139.000.
Seidewand, Edward H., 4,074,547, Cl. 70-1.500.
General Signal Corporation: *See—*
Clark, Gary E.; Frielinghaus, Klaus H.; and Smith, Barry L., 4,074,879, Cl. 246-37.000.
Engle, Thomas H., 4,074,700, Cl. 137-625.270.
Walley, Everette D., Jr., 4,075,502, Cl. 307-64.000.
Gennari, Luigi, to Kartocol Anstalt. Process and apparatus for glueing carton bodies. 4,074,618, Cl. 93-49.00M.
Genoa Coal Company: *See—*
Burkett, Joseph C.; and Harshbarger, Harry L., 4,075,675, Cl. 361-48.000.
Geren, Lorenzo Dow: *See—*
Greenawalt, Eddie Lee; and Geren, Lorenzo Dow, 4,074,504, Cl. 53-22.00A.
Gergis, Isoris S., to Rockwell International Corporation. Consecutive bit access of magnetic bubble domain memory devices. 4,075,611, Cl. 365-2.000.
Gergis, Isoris S.: *See—*
Chen, Thomas T.; and Gergis, Isoris S., 4,075,709, Cl. 365-2.000.
Gerhardt, Hans Joachim: *See—*
Kramer, Carl; Stein, Heinrich; and Gerhardt, Hans Joachim, 4,074,841, Cl. 226-97.000.
Gerhardt, Wolfgang, to Tetenal Photowerk Walter Grabig. Color picture development process. 4,075,014, Cl. 96-22.000.
Gerrans, Alfred W., to Sunsweet Growers, Inc. Continuous grader for fruits or the like. 4,075,087, Cl. 209-99.000.
Gertner, Edward R.: *See—*
Clarke, John Elwood; Andrews, Austin M., II; Gertner, Edward R.; Longo, Joseph T.; and Pasko, John G., 4,075,043, Cl. 148-171.000.
Gesellschaft fur Mathematik und Datenverarbeitung mbH Bonn: *See—*
Berkling, Klaus, 4,075,689, Cl. 364-200.000.
Gewerkschaft Eisenhutte Westfalia: *See—*
Grundken, Dieter; and Temme, Helmut, 4,074,804, Cl. 198-735.000.
Gewerkschaft Eisenhutte Westphalia: *See—*
Weirich, Walter; and Kussel, Willy, 4,074,695, Cl. 137-508.000.
Geyer, Paul. Extrusion and mixing apparatus. 4,075,712, Cl. 366-79.000.
Ghisler, Walter; Marlevi, Aleksander; and Anas, Johan Olof, to Telefonaktiebolaget L M Ericsson. Device for providing phase synchronism of a transit station in a digital telecommunication network. 4,075,428, Cl. 179-15.0BS.
Gibbon, Alan, to Johnson, Matthey & Co., Limited. Method of recovering platinum group metal values from a used washcoated catalyst. 4,074,865, Cl. 241-24.000.
Gibbons, Loren Kenneth, to FMC Corporation. 3-Aminoisothiazole derivatives as herbicides. 4,075,001, Cl. 71-90.000.
Gielly, Jean-Francois, to Rhone-Poulenc Industries. Continuous process for the manufacture of phosphoric acid using process water. 4,075,305, Cl. 423-320.000.
Gilbert, Barrie, to Tektronix, Inc. Wideband differential amplifier. 4,075,574, Cl. 330-257.000.
Gilbert, Joseph; McRobbie, Malcolm McKenzie; and Gee, Wilfred, to Ozalid Group Holdings Limited. Electrostatic multi-copier. 4,075,637, Cl. 346-153.000.
Gilbert, Robert E. Earth auger. 4,074,780, Cl. 175-392.000.
Gill, Stephen H.; Knell, Harvey A.; and Tucker, Joseph M., III, to Caterpillar Tractor Co. Shovel linkage for a hydraulic excavator. 4,074,820, Cl. 214-138.00R.
Gillespie, Robert M.; and Ricks, John R., to Cypro Corporation. Sorting apparatus. 4,074,808, Cl. 209-73.000.
Gillette Company, The: *See—*
Moyer, Alan Ray, 4,075,458, Cl. 219-225.000.
Gillooly, George R.: *See—*
Piper, William W.; Prener, Jerome S.; and Gillooly, George R., 4,075,532, Cl. 313-497.000.
Gilson Brothers Company: *See—*
Enters, Edward W., 4,074,764, Cl. 172-42.000.
Girard-Perregaux S.A.: *See—*
Donze, Jean-Marie; and Vuffray, Georges, 4,074,513, Cl. 58-4.00A.
Gist-Brocades N.V.: *See—*
Marx, Arthur Friedrich; and Barendse, Nicolaas Cornelis Maria Emanuel, 4,075,233, Cl. 260-397.300.
Marx, Arthur Friedrich; Verwey, Jan; and Smid, Peter Max, 4,075,337, Cl. 424-246.000.
GL.GE. Apparecchiature Elettroniche Industriali S.p.A.: *See—*
Franzolini, Luciano, 4,074,579, Cl. 73-507.000.
Glaxo Laboratories Limited: *See—*
Fleming, Ian D.; Turner, Michael K.; and Brewer, Stephen J., 4,075,061, Cl. 195-29.000.
Gleinig, Harald E. K., to Colour-Chem Ltd. Process for manufacture of benzidine pigments. 4,075,198, Cl. 260-161.000.
Glikman, Mark Leonovich; Sapunar, Zakhar Isaevich; Avrus, Albert Vladimirovich; Gorokhovsky, Vladilen Alexandrovich; Fainberg, Evgeny Borisovich; Ivanov, Vladimir Alexandrovich; Shirkevich, Tatyana Leonidovna; and Sizov, Vadim Mikhailovich. Process and apparatus for the manufacture of ornamental sheet glass. 4,074,994, Cl. 65-44.000.
Globe Tool and Engineering Company, The: *See—*
Pearsall, Harold L., 4,074,418, Cl. 29-596.000.

Gnaedinger, Donald J., to Basler Electric Company. Power supply apparatus. 4,075,504, Cl. 307-66.000.

Goffe, Charles A., deceased (by Goffe, Patricia Anne, executrix); and Heseltine, Donald W., to Eastman Kodak Company. Photothermographic material containing a combination of energy-sensitive organic dyes and process of forming a positive or negative image with the material. 4,075,017, Cl. 96-48.0HD.

Goffe, Patricia Anne, executrix: *See*—
Goffe, Charles A., deceased; and Heseltine, Donald W., 4,075,017, Cl. 96-48.0HD.

Goitein, Michael: *See*—
Boyd, Douglas P.; and Goitein, Michael, 4,075,492, Cl. 250-445.00T.

Goldblatt, Lawrence; Weiss, Werner; and MacIntyre, Peter A., to Textron, Inc. Saw chain comprising cam links and cutter links without integral depth gauges. 4,074,604, Cl. 83-830.000.

Goldstone, Bertram J.: *See*—
Shapiro, Gerald N.; Goldstone, Bertram J.; Simone, Joseph D.; and Spignese, Edward E., 4,075,630, Cl. 343-5.0DP.

Gole, Monsieur Jean: *See*—
Graveron, Bernard Jacques; and Essel, Alain Jacques, 4,075,288, Cl. 260-879.000.

Goltermann, Wandel U.: *See*—
Harzer, Peter, 4,075,558, Cl. 324-99.00R.

Gooding, Marvin Sexton. Telescoping hood fireplace. 4,074,680, Cl. 126-142.000.

Gore, Gerald D.: *See*—
Morrell, Roger J.; Gunn, Jerome A.; and Gore, Gerald D., 4,074,778, Cl. 175-91.000.

Gorgens, Richard A., to Incoterm Corporation. Cash dispensing system. 4,075,460, Cl. 235-420.000.

Gorin, Everett, to Continental Oil Company. Coal liquefaction process with removal of agglomerated insolubles. 4,075,080, Cl. 208-8.000.

Gorog, Sandor: *See*—
Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcz, 4,075,249, Cl. 260-613.00D.

Gorokhovsky, Vladilen Alexandrovich: *See*—
Glikman, Mark Leonovich; Sapunar, Zakhar Isaevich; Avrus, Albert Vladimirovich; Gorokhovsky, Vladilen Alexandrovich; Fainberg, Evgeny Borisovich; Ivanov, Vladimir Alexandrovich; Shirkevich, Tatyana Leonidovna; and Sizov, Vadim Mikhailovich, 4,074,994, Cl. 65-44.000.

Gould, Harvey Mitchell. Parallel silent communicator. 4,075,426, Cl. 179-1.00H.

Gould Inc.: *See*—
Sabatino, Anthony; and Rao, Purushothama, 4,075,399, Cl. 429-57.000.
Snyder, Daniel S.; and Luzsicza, Steven O., 4,075,603, Cl. 340-58.000.

Goulds, Anthony John, to Gunson's (Mineral & Automation) Limited. Apparatus for feeding objects to a point of use. 4,074,807, Cl. 209-73.000.

Gourley, Dennis R., to Film Cassette Inc. Long-play video tape cassette. 4,074,876, Cl. 242-199.000.

Gower, Stephen G. M.; Morris, Cyril R.; and Wright, Ernest. Leveling devices for use in high speed liquid sampling systems. 4,074,976, Cl. 23-292.000.

Grabenhofer, John D.: *See*—
Brockschmidt, Willis H.; Brockschmidt, Robert W.; and Grabenhofer, John D., 4,074,561, Cl. 73-17.00R.

Graber, Elmer A.: *See*—
Hobson, Willis S.; and Graber, Elmer A., 4,074,698, Cl. 137-614.060.

Grabowski, John J.: *See*—
Rambauske, Werner R.; and Grabowski, John J., 4,074,416, Cl. 29-527.400.

Graham Magnetics Incorporated: *See*—
Manly, William A., 4,075,672, Cl. 360-135.000.

Grakauskas, Vytautas: *See*—
Baum, Kurt; and Grakauskas, Vytautas, 4,075,246, Cl. 260-584.00C.

Graveron, Bernard Jacques; and Essel, Alain Jacques, to Gole, Monsieur Jean. Vibration-damping material. 4,075,288, Cl. 260-879.000.

Gravey, Guy; Grolla, Paul; and Roth, Andre, to Metaux Speciaux S.A. Process for recovering molybdenum values from spent catalysts. 4,075,278, Cl. 423-55.000.

Gravey, Guy: *See*—
Castagna, Herman; Gravey, Guy; and Roth, Andre, 4,075,277, Cl. 423-55.000.

Gray, Thomas J.; and Wojtowicz, Jan, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Flexible lead chloride cathode construction. 4,074,733, Cl. 141-32.000.

Grearson, Kenneth R., to Multuloc Corporation. Panel wall construction. 4,074,486, Cl. 52-235.000.

Greenawalt, Eddie Lee; and Geren, Lorenzo Dow, to Dow Chemical Company, The. Method of forming filling and sealing an industrial size bag. 4,074,504, Cl. 53-22.00A.

Greer, Richard L., to Upjohn Company, The. Process of making a cured resole foam and product produced therefrom. 4,075,139, Cl. 260-2.50F.

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Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Kudryakov, Mikhail Nikolaevich; Tsipkis, Alexandr Moiseevich; Yakovlev, Vladimir Germogenovich; Averbukh, Alexandr Samoilovich; Scherbakov, Jury Ilich; Yakobson, Natalia Dmitrievna; Semikozov, Vyacheslav Fedorovich; Medvedev, Viktor Vladimirovich; Yartsev, Valery Vasilievich; Kaganov, July Davydovich; Kuznetsov, Vladimir Ivanovich; and Sinelnikov, Alexandr Iosifovich. Hole drilling machine. 4,074,773, Cl. 173-23.000.

Grill, Michael; Grohmann, Helmut; and Nossler, Franz, to Veitscher Magnesitwerke-Actien-Gesellschaft. Control system for an absorption column. 4,075,293, Cl. 261-20.000.

Grinberg, Grigory Efimovich: *See*—
Bashkovich, Alexandr Pavlovich; Zimnukhova, Evgenia Semenovna; Prokopovich, Agnessa Vladimirovna; Polatovskaya, Olga Grigorievna; Pronina, Maria Ivanovna; Kulbakh, Valter Osvaldovich; Rivkina-Pevtsova, Khasya Ionovna; and Grinberg, Grigory Efimovich, 4,075,322, Cl. 424-94.000.

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Groh, Edward F.; and Cassidy, Dale A., to United States of America, Energy. Method of sealing. 4,074,848, Cl. 228-173.00C.

Grohmann, Helmut: *See*—
Grill, Michael; Grohmann, Helmut; and Nossler, Franz, 4,075,293, Cl. 261-20.000.

Grolla, Paul: *See*—
Gravey, Guy; Grolla, Paul; and Roth, Andre, 4,075,278, Cl. 423-55.000.

Gronlie, John Peter. Dock bracket. 4,074,537, Cl. 61-48.000.

Grosch, Karl A.: *See*—
van der Burg, Sjirk; Grosch, Karl A.; and Bertrand, Marcel J., 4,074,743, Cl. 152-355.000.

Gross, William G.; Long, Henry A., Jr.; and Yamshak, John R., to Armstrong Cork Company. Edge coating applicator nozzle. 4,074,655, Cl. 118-410.000.

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Groth, Donald L.: *See*—
Skubic, Leroy F.; Donkle, Lucius B., Jr.; and Groth, Donald L., 4,074,812, Cl. 211-192.000.

Grubis, Bernard, to Compagnie Generale de Radiologie. Hot-cathode X-ray tube having an end-mounted anode. 4,075,526, Cl. 313-56.000.

Grubman, Alan A.: *See*—
Pelton, Peter G.; Grubman, Alan A.; and Hasegawa, Gary, 4,075,099, Cl. 210-168.000.

Grumman Aerospace Corporation: *See*—
Oman, Richard A.; and Foreman, Kenneth M., 4,075,500, Cl. 290-55.000.

Grundken, Dieter; and Temme, Helmut, to Gewerkschaft Eisenhutte Westfalia. Scraper-chain conveyors. 4,074,804, Cl. 198-735.000.

Gruppo Lepetit S.p.A.: *See*—
Bellasio, Elvio; and Cristiani, Franco, 4,075,241, Cl. 560-73.000.
Omodei-Sale, Amedeo; Consonni, Pietro; and Lerner, Leonard, 4,075,341, Cl. 424-258.000.
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Gruz, Boris Efimovich: *See*—
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Rymareva, Tatyana Ivanovna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; and Alexeeva, Ljubov Antonovna, 4,075,168, Cl. 260-46.50R.
Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.

GSW Limited/Limitee: *See*—
Smith, David G., 4,074,825, Cl. 220-4.00R.

GTE Laboratories Incorporated: *See*—
Fulenwider, John E.; Belmonte, Carl; and Dakss, Mark L., 4,074,840, Cl. 225-96.500.

GTE Sylvania Incorporated: *See*—
Passavant, Francis C.; and Pease, Richard R., 4,075,620, Cl. 340-324.0AD.
Pitel, Ira J., 4,075,476, Cl. 315-209.00R.

Guild, Charles L.; and Willard, Goodman B. Expansible mandrel with an external, cable actuating winch. 4,074,539, Cl. 61-53.720.

Gulett, Michael R., to NCR Corporation. Semiconductor processing of silicon nitride. 4,075,367, Cl. 427-94.000.

Gulf Research & Development Company: *See*—
Lakshmanan, Pallavoor R., 4,075,149, Cl. 260-29.40R.

Gulf & Western Industries, Inc.: *See*—
Battle, Francis L., 4,075,563, Cl. 324-236.000.

Gulf & Western Manufacturing Company: *See*—
Pim, Norman L., 4,074,558, Cl. 72-239.000.

Gunn, Jerome A.: *See—*
Morrell, Roger J.; Gunn, Jerome A.; and Gore, Gerald D., 4,074,778, Cl. 175-91.000.

Gunson's (Mineral & Automation) Limited: *See—*
Goulds, Anthony John, 4,074,807, Cl. 209-73.000.

Guschin, Alexandr Evgenievich: *See—*
Amosov, Vladimir Alexandrovich; Guschin, Alexandr Evgenievich; Efremov, Jury Nikolaevich; and Smirnov, Rudolf Evgenievich, 4,075,028, Cl. 106-186.000.

Guseva, Valentina Ivanovna: *See—*
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Zimnukhov, Viktor Alexandrovich; Miroshnikova, Lidia Alexeevna; Kimel, Esfir Abramovna; Chefranova, Edit Konstantinovna; Guseva, Valentina Ivanovna; and Masagutova, Ljudmila Vladimirovna, 4,075,166, Cl. 260-45.95H.

Gutha, Edward. Portable antenna assembly for television receiver. 4,075,634, Cl. 343-742.000.

Gutner, Kenneth H. Bed canopy frame. 4,074,377, Cl. 5-362.000.

Gutowski, Gerald E.: *See—*
Katner, Allen S.; Gutowski, Gerald E.; and Miller, Jean C., 4,075,214, Cl. 260-287.00B.

GW Electronics, Inc.: *See—*
Woodward, Roger P., 4,075,549, Cl. 324-28.00R.

Haag, Robert A.; Rousseau, Patrick M.; and Martin, Thom O., to General Foods Corporation. Cereal process and product. 4,075,356, Cl. 426-285.000.

Haspala, Ray. Cake decorator's turntable. 4,074,656, Cl. 118-502.000.

Haas, Dieter, to Blaupunkt-Werke GmbH. Printed circuit coils. 4,075,591, Cl. 336-200.000.

Habelt, Gerhard: *See—*
Louzil, Friedrich; Habelt, Gerhard; and Mrazek, Gustav, 4,075,669, Cl. 360-92.000.

Haberer, Merle D. Charging system for automobile batteries. 4,075,545, Cl. 320-61.000.

Haberli, Roland: *See—*
Lacroix, Roger; and Haberli, Roland, 4,074,966, Cl. 8-41.00R.

Hacker, Walter L., Jr. Ceiling support clip. 4,074,885, Cl. 248-317.000.

Hagedorn, Floyd T.; Rahrig, Donald D.; and Revells, Robert G., to Libbey-Owens-Ford Company. Method of and apparatus for bending glass sheets. 4,074,996, Cl. 65-106.000.

Hagino, Minoru: *See—*
Hara, Katsuo; Hagino, Minoru; and Sukegawa, Tokuzo, 4,075,654, Cl. 357-30.000.

Hagiwara Denki Kabushiki Kaisha: *See—*
Hattori, Shuzo; and Hiramatsu, Tadao, 4,075,516, Cl. 310-334.000.

Hahmann, Otto: *See—*
Denzel, Horst; and Hahmann, Otto, 4,075,290, Cl. 260-897.00A.

Hailey, James L.: *See—*
Monk, James T.; Hailey, James L.; and Boyles, Tonnie M., 4,074,801, Cl. 198-304.000.

Haines, Walter E.; and Richardson, Mason E., to Estan Manufacturing Company. Sealing plug assembly. 4,074,828, Cl. 220-254.000.

Hair, Michael L.: *See—*
Ward, Anthony T.; Damjanovic, Aleksandar; and Hair, Michael L., 4,075,013, Cl. 96-1.50R.

Hajdu, Juan; and Sosnowski, Raymond A., to Enthone, Incorporated. Solar collector having selective film of improved stability to liquid water condensate. 4,074,706, Cl. 126-271.000.

Hale, Dean H. Power unit for a medical or like stool. 4,074,887, Cl. 248-404.000.

Hall, Jack F., to U-Cart Concrete Systems, Inc. Concrete mixing system. 4,075,711, Cl. 366-26.000.

Halliburton Company: *See—*
Young, Bill M., 4,074,536, Cl. 61-36.00C.

Halpert, David: *See—*
Blasnik, William; and Halpert, David, 4,074,838, Cl. 223-85.000.

Hamada, Yoshitugu: *See—*
Maruyama, Masayuki; Hamada, Yoshitugu; and Yamauchi, Ryoichi, 4,074,956, Cl. 418-178.000.

Hamalainen, Lauri: *See—*
Melaja, Asko J.; and Hamalainen, Lauri, 4,075,406, Cl. 536-1.000.

Hamamatsu Terebi Kabushiki Kaisha: *See—*
Hara, Katsuo; Hagino, Minoru; and Sukegawa, Tokuzo, 4,075,654, Cl. 357-30.000.

Hambleton, Peter: *See—*
Knill, Kenneth George; Bowler, Michael Kendal; and Hambleton, Peter, 4,075,027, Cl. 106-99.000.

Hamilton Technology, Inc.: *See—*
Nelson, John E., 4,074,433, Cl. 32-14.00E.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Apparatus for printing and applying pressure sensitive labels. 4,075,052, Cl. 156-384.000.

Hammann, Ingeborg: *See—*
Hoffmann, Hellmut; and Hammann, Ingeborg, 4,075,330, Cl. 424-200.000.

Hammond Corporation: *See—*
Stoiber, Alto, 4,074,846, Cl. 227-51.000.

Hammonds, James C.: *See—*
Hicks, Paul E., Jr.; and Hammonds, James C., 4,074,633, Cl. 105-368.00B.

Hamprecht, Gerhard; Schirmer, Ulrich; Wuerzer, Bruno; and Retzlaff, Guenter, to BASF Aktiengesellschaft. 2,1,3-Benzothiadiazines. 4,075,004, Cl. 71-91.000.

Handa, Minoru: *See—*
Horiie, Shigeki; Asai, Shin-Ichiro; Torikoshi, Takashi; Shirakawa, Kazuhiro; and Handa, Minoru, 4,075,253, Cl. 260-665.00R.

Handy & Harman: *See—*
Korbelak, Alexander; and King, John, 4,075,065, Cl. 204-43.00G.

Hankosky, Andrew; and Schoeneweis, E. Frederick, to Rockwell International Corporation. Coupling. 4,074,542, Cl. 64-30.00R.

Hanni, Stephen L.; and Johnson, Dudley B., to Texas Instruments Incorporated. Printed wiring board with angled portion and its method of manufacture. 4,074,419, Cl. 29-625.000.

Hanseatischer Maschinenbau G.m.b.H.: *See—*
Kunig, Helmut; and Reinke, Klaus, 4,074,394, Cl. 19-159.00R.

Hansen, Einar T.: *See—*
Cavil, David T.; Hansen, Einar T.; and Schmidt, Henry J., 4,074,669, Cl. 123-148.0CC.

Hanson, Richard J., to General Motors Corporation. Optical-electronic interface connector. 4,075,477, Cl. 250-227.000.

Hansson, Hans-Erik, to Stal-Laval Turbin AB. Composite epicyclic gear ring and method of manufacture. 4,074,583, Cl. 74-413.000.

Hanusiak, William M.: *See—*
White, Eugene W.; Hanusiak, William M.; and White, Rodney A., 4,075,092, Cl. 210-22.00R.

Hara, Katsuo; Hagino, Minoru; and Sukegawa, Tokuzo, to Hamamatsu Terebi Kabushiki Kaisha. Semiconductor photoelectron emission device. 4,075,654, Cl. 357-30.000.

Harada, Hisamitsu: *See—*
Nohara, Tomiyasu; Matsuno, Yoshiyuki; Harada, Hisamitsu; and Yamada, Akinori, 4,074,440, Cl. 34-92.000.

Harada, Jumei: *See—*
Nishimura, Kazuhiro; Harada, Jumei; Migita, Tetsuhiko; and Matsunaga, Tsutomu, 4,075,275, Cl. 264-313.000.

Haraikawa, Tetsuo: *See—*
Hayashida, Yoshihiro; and Haraikawa, Tetsuo, 4,074,532, Cl. 60-562.000.

Hardesty, Edwin Charles: *See—*
Bloxham, Gordon Foreman; Brezeale, Claude Paren; Cocco, Eugene Raymond; Hardesty, Edwin Charles; Small, Byron Lee; Steinert, Daniel Marion; and McGonigal, Charles, 4,075,299, Cl. 264-25.000.

Harig, Manfred, to N.V. Western Gear Europe S.A. Hoisting device. 4,074,582, Cl. 74-230.240.

Harken, Peter O., to Vanguard, Inc. Plural bearing and sheave assembly. 4,074,892, Cl. 254-188.000.

Harmon, Flossie G. Shampooing unit. 4,074,369, Cl. 4-159.000.

Harmony, George W., III, to Mediglas, Inc. Bathing apparatus for hospital or bedridden patients. 4,074,370, Cl. 4-173.00R.

Harrer, Paul H.: *See—*
Adams, Charles E.; Quackenbush, Harold E.; Harrer, Paul H.; Langford, Le Roy; and Cleek, Alvin L., 4,074,830, Cl. 221-266.000.

Harris, Ramsay L. Versatile hand loom. 4,074,726, Cl. 139-29.000.

Harris, Richard K.; Jewsbury, (Charles) Bill (William); and Shoup, Dale W., to Slope Indicator Company, The. Vibratory-wire strain gage. 4,074,565, Cl. 73-88.50R.

Harshbarger, Harry L.: *See—*
Burkett, Joseph C.; and Harshbarger, Harry L., 4,075,675, Cl. 361-48.000.

Hart, Lawrence: *See—*
Parker, William H.; and Hart, Lawrence, 4,074,762, Cl. 166-315.000.

Hart, Richard: *See—*
Mowbray, Warwick; Hart, Richard; and Cavey, William, 4,074,659, Cl. 119-159.000.

Harzer, Peter, to Goltermann, Wandel U. Method of and system for metering a periodically varying voltage. 4,075,558, Cl. 324-99.00R.

Hasegawa, Gary: *See—*
Pelton, Peter G.; Grubman, Alan A.; and Hasegawa, Gary, 4,075,099, Cl. 210-168.000.

Hashimoto, Hiroshi; Abe, Tetsuo; and Kato, Akira, to Sanyo Machine Works, Ltd. Apparatus for automatically feeding and setting stud bolts. 4,074,425, Cl. 29-813.000.

Hattori, Shuzo; and Hiramatsu, Tadao, to Hagiwara Denki Kabushiki Kaisha. Diffraction electroacoustic transducer. 4,075,516, Cl. 310-334.000.

Hattori, Tadashi: *See—*
Obayashi, Hideki; Kohama, Tokio; Hattori, Tadashi; and Nishida, Minoru, 4,074,566, Cl. 73-116.000.

Haven Industries, Inc.: *See—*
Dickstein, Jack, 4,075,411, Cl. 560-224.000.

Hay, Robert A., II, to Dow Chemical Company, The. Method of insulating a container. 4,075,264, Cl. 264-46.500.

Hayashi, Hideaki; and Kakuta, Susumu, to Nippon Columbia Kabushikikaisha. Tension servo apparatus. 4,074,873, Cl. 242-75.430.

Hayashi, Takeshi: *See—*
Ochiai, Tomoyoshi; Hayashi, Takeshi; and Furuse, Mituhiro, 4,075,697, Cl. 364-481.000.

Hayashida, Yoshihiro; and Haraikawa, Tetsuo, to Tokico Ltd. Hydraulic master cylinder. 4,074,532, Cl. 60-562.000.

Hayasi, Yosio: *See—*
Konno, Kazuhiko; Hayasi, Yosio; Taniyama, Eiji; and Sekiya, Tetsuo, 4,075,121, Cl. 252-407.000.

Hayenga, Godfrey B. Aerial device. 4,074,877, Cl. 244-155.00R.

Hayes, John C.: *See—*
Politzer, Ernest L.; and Hayes, John C., 4,075,259, Cl. 260-683.680.

Hayes, Robert A.: *See*—
Ambrose, Richard J.; and Hayes, Robert A., 4,075,186, Cl. 260-887.000.

Haylock, John Christopher: *See*—
Lofquist, Robert Alden; and Haylock, John Christopher, 4,075,271, Cl. 264-210.00F.

Heaps, John Bernard: *See*—
Senior, Ascanius John; and Heaps, John Bernard, 4,074,657, Cl. 119-29.000.

Heater, Guy C., Jr. Pavement mat and process. 4,074,948, Cl. 404-75.000.

Heberlein Maschinenfabrik AG: *See*—
Luthi, Walter, 4,074,544, Cl. 68-5.00E.

Heffron, Charles Buckner, to Magnavox Company, The. Automatic peaking circuit. 4,075,661, Cl. 358-166.000.

Hegel, Robert W.: *See*—
Paul, George A.; Hegel, Robert W.; Bethell, Michael R.; Branham, Charles L.; and Utter, Allan D., 4,075,098, Cl. 210-168.000.

Heinemann Electric Company: *See*—
Aadahl, Frank P., 4,075,446, Cl. 200-144.00R.

Held, Lisa: *See*—
Patton, Ann T.; Roscetti, Betty Ann; and Held, Lisa, 4,074,381, Cl. 9-310.00J.

Helfferich, Fred G.: *See*—
Hill, Harold J.; Reisberg, Joseph; Helfferich, Fred G.; Lake, Larry W.; and Pope, Gary A., 4,074,755, Cl. 166-252.000.

Hellrung, Friedrich: *See*—
Vopel, Karl Heinz; Hellrung, Friedrich; and Berendes, Otto, 4,075,292, Cl. 260-986.000.

Helversen, Frederick D.; and Rivers, Morris R., to Helversen, Frederick D. Rotary through dryer having multiple vacuum chambers and associated heaters. 4,074,441, Cl. 34-122.000.

HemoTec, Inc.: *See*—
Braun, Walter Jacob; Altshuler, John Henry; and Cherry, Peter Whitfield, 4,074,971, Cl. 23-230.00B.

Hendee, Leon Clyde, III: *See*—
Cooper, David Eugene; Hendee, Leon Clyde, III; Hill, Walter Guy, Jr.; Leshem, Adam; and Marugg, Martin Lewis, 4,074,814, Cl. 214-1.0BB.

Hendriks, Nicolaas Arie, to Bouwmaatschappij Nederhorst B. V. Safety wall for a storage tank. 4,074,485, Cl. 52-224.000.

Hepworth & Grandage Ltd.: *See*—
Cockcroft, Frederick Edward, 4,074,617, Cl. 92-228.000.

Hercules Incorporated: *See*—
Douglas, Paul S.; Patellis, Anargiros Pete; and Vredenburgh, Walter A., 4,075,404, Cl. 526-237.000.

Hereth, Ralph F. Fluid pressure actuator for producing rotational motion. 4,074,611, Cl. 91-179.000.

Herr, John Addison, to Singer Company, The. Sewing machine with programmable memory. 4,074,642, Cl. 112-158.00E.

Heseltine, Donald W.: *See*—
Goffe, Charles A., deceased; and Heseltine, Donald W., 4,075,017, Cl. 96-48.0HD.

Hesston Corporation: *See*—
White, Allen A., 4,074,623, Cl. 100-3.000.

Hester, Jackson B., Jr., to Upjohn Company, The. Process for preparing triazolobenzodiazepines. 4,075,221, Cl. 260-308.00R.

Hettche, Albert: *See*—
Scheuermann, Horst; and Hettche, Albert, 4,075,211, Cl. 260-270.00H.

Hewlett-Packard Company: *See*—
Christopher, Chris J.; Wenninger, Fred W.; Morris, Donald E.; Covington, Wayne F.; Folsom, Jerry B.; Beyers, Joseph W.; Nairn, John H.; and Osborne, Jeffrey C., 4,075,679, Cl. 364-200.000.
Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 4,075,481, Cl. 250-343.000.

Hicklin, Denis Raymond; and Attwood, Brian William, to Karl Kroyer St. Anne's Limited. Method and apparatus for dry forming a layer of fibers. 4,074,393, Cl. 19-303.000.

Hicks, Paul E., Jr.; and Hammonds, James C., to ACF Industries, Incorporated. Trailer hitch having elastomer-in-shear cushioning in the diagonal strut. 4,074,633, Cl. 105-368.00B.

Higginbottom, Harold P.: *See*—
Burke, William D.; Higginbottom, Harold P.; and Le Blanc, John R., 4,075,403, Cl. 429-253.000.

High, Thaine. Baseball batting cages. 4,074,905, Cl. 273-26.00D.

Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., to United States of America, Health, Education and Welfare. Polycarbonate membranes and production thereof. 4,075,108, Cl. 210-500.00M.

Higosaki, Nobuyuki: *See*—
Kuyama, Hiroshi; and Higosaki, Nobuyuki, 4,075,326, Cl. 424-141.000.

Higuchi, Masaru, to West Electric Co., Ltd. Reflector for flash light apparatus. 4,075,472, Cl. 362-255.000.

Hill, Charles M.: *See*—
Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 4,075,481, Cl. 250-343.000.

Hill, Harold J.; Reisberg, Joseph; Helfferich, Fred G.; Lake, Larry W.; and Pope, Gary A., to Shell Oil Company. Ion exchange controlled chemically aided waterflood process. 4,074,755, Cl. 166-252.000.

Hill, Walter Guy, Jr.: *See*—
Cooper, David Eugene; Hendee, Leon Clyde, III; Hill, Walter Guy, Jr.; Leshem, Adam; and Marugg, Martin Lewis, 4,074,814, Cl. 214-1.0BB.

Hilley, Larry L.; and Neff, Marion W., to Recognition Equipment Incorporated. Character recognition unit. 4,075,605, Cl. 340-146.3AC.

Hilti Aktiengesellschaft: *See*—
Busler, Albert, 4,074,609, Cl. 85-77.000.
Oesterle, Helmut, 4,074,843, Cl. 227-8.000.

Hinckley, William L., Jr., to Rockwell International Corporation. Averaging and peak detection circuit. 4,075,513, Cl. 307-350.000.

Hiramatsu, Tadao: *See*—
Hattori, Shuzo; and Hiramatsu, Tadao, 4,075,516, Cl. 310-334.000.

Hirano, Yutaka: *See*—
Sakurada, Ichiro; Okada, Toshio; and Hirano, Yutaka, 4,075,075, Cl. 204-159.170.

Hirata, Yasuo: *See*—
Takahata, Fumio; Inagaki, Kazunori; and Hirata, Yasuo, 4,075,429, Cl. 179-15.0BM.

Hirayama, Takanobu: *See*—
Hishida, Yukio; Watanabe, Tomoyoshi; Hirayama, Takanobu; and Asakura, Hideo, 4,074,799, Cl. 197-151.000.

Hirono, Yoshihiko: *See*—
Sawaki, Mikio; Iwataki, Isao; Hirono, Yoshihiko; and Ishikawa, Hisao, 4,075,239, Cl. 260-464.000.

Hirsbrunner, Pierre; Beyeler, Theodor; and Shepherd, David, to Societe d'Assistance Technique pour Produits Nestle S.A. Process for protecting organic materials using a bacteriostatic coffee extract. 4,075,329, Cl. 424-195.000.

Hirsch, Allen Frederick, to Ortho Pharmaceutical Corporation. Inhibition of male fertility with aliphatic sulfamates. 4,075,351, Cl. 424-303.000.

Hirschman, Abraham. Plant support. 4,074,461, Cl. 47-70.000.

Hishida, Yukio; Watanabe, Tomoyoshi; Hirayama, Takanobu; and Asakura, Hideo, to Brother Kogyo Kabushiki Kaisha. Ribbon cartridge having slack preventing means. 4,074,799, Cl. 197-151.000.

Hishiki, Tetsuo: *See*—
Yagi, Hideaki; and Hishiki, Tetsuo, 4,075,449, Cl. 200-315.000.

Hitachi, Ltd.: *See*—
Mukaemachi, Takuji; Takeshita, Tetsuo; Miyoshi, Tatsuru; and Kojima, Takafumi, 4,075,431, Cl. 179-18.0GF.

Hitachi Metals, Ltd.: *See*—
Matake, Naomasa; Yoshimura, Tadayoshi; and Sato, Kuniaki, 4,074,947, Cl. 403-406.000.

Hobson, Willis S.; and Graber, Elmer A., to Seymour Manufacturing Co., Inc. Hydraulic coupler. 4,074,698, Cl. 137-614.060.

Hochiki Corporation: *See*—
Masuda, Hajime; Takeuchi, Takeshi; Watanabe, Masakatsu; and Tomioka, Yukio, 4,075,628, Cl. 340-416.000.

Hochmuth, Frank William, to Combustion Engineering, Inc. Burning hydrogen and oxygen to superheat steam. 4,074,708, Cl. 126-360.00A.

Hochmuth, Walter; and Hollfelder, Hans Peter, to Robert Zapp, Werkzeug-und Maschinenfabrik GmbH. Cutting tool. 4,074,949, Cl. 407-114.000.

Hochstetler, Samuel A. C-Clamp. 4,074,899, Cl. 269-249.000.

Hodges, Jimmie Ray, to Pennwalt Corporation. Electrolytic cell. 4,075,077, Cl. 204-269.000.

Hodgson, James H., to Chromalloy American Corporation. Trailer for farm tractors with driven member powered by p.t.o. 4,074,639, Cl. 111-6.000.

Hodil, Elmer Raleigh, Jr., to Olin Corporation. Gravity feed hot top tool. 4,074,844, Cl. 227-8.000.

Hoechst Aktiengesellschaft: *See*—
Fuchs, Hermann; Kapaun, Gustav; and Meininger, Fritz, 4,074,967, Cl. 8-54.000.
Holst, Arno; and Kostrzewa, Michael, 4,075,279, Cl. 536-88.000.
Kruse, Hubert; and Sommer, Karl, 4,074,965, Cl. 8-41.00R.

Hoehn, Hans: *See*—
Denzel, Theodor; and Hoehn, Hans, 4,075,210, Cl. 260-256.40F.

Hoehn, Richard F.; Morris, Hugh C.; Therkildsen, Henry T.; and Behrends, Bertwin E., to Caterpillar Tractor Co. Adjustable sequence valve for towing winch hydraulic controls. 4,074,796, Cl. 192-3.570.

Hoeschele, Guenther Kurt, to Du Pont de Nemours, E. I., and Company. Composition for curing polyurethanes. 4,075,150, Cl. 260-30.60R.

Hofer, Kurt; and Tscheulin, Guenther, to Sandoz Ltd. Benzene phosphonous acid compounds, their production and use as stabilizers for organic materials. 4,075,163, Cl. 260-45.70P.

Hoffman, Neil R.; and Jansen, Johannes H., to Brake Engineering, Inc. Disc brake apparatus suitable for bicycles. 4,074,910, Cl. 280-289.00R.

Hoffman, Robert P., to General Motors Corporation. Self clamping armature casing for an electric motor driven fluid pump. 4,075,522, Cl. 310-214.000.

Hoffmann, Hellmut; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. O,S-Dialkyl-o-[1-alkyl-3,4-trimethylene-pyrazol(5)yl]-thionothiolphosphoric acid ester. 4,075,330, Cl. 424-200.000.

Hoffmann, Kurt, to Siemens Aktiengesellschaft. Digital differential amplifier for CCD arrangements. 4,075,515, Cl. 307-362.000.

Hoffmann-La Roche, Inc.: *See*—
Jernow, Jane Liu; and Rosen, Perry, 4,075,209, Cl. 260-256.40N.
Josse, Rene, 4,075,333, Cl. 424-237.000.

Hofmann, Fritz, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Method and circuit arrangement for adapting

the measuring range of a measuring device operating with delta modulation in a navigation system. 4,075,701, Cl. 364-579.000.
Hogan, Thomas Leo: *See—*
Lang, Robert S.; Post, Rodney Morris; and Hogan, Thomas Leo, 4,074,481, Cl. 52-169.800.
Hohmann, Volker: *See—*
Storp, Klaus; Wirth, Hans; Rittinger, Gunter; and Hohmann, Volker, 4,075,282, Cl. 423-230.000.
Holler, Richard P.; and McMath, Connie W., to United States of America, Air Force. Pressure actuated collapsible curtain liners for a gas turbine engine nozzle. 4,074,523, Cl. 60-266.000.
Hollfelder, Hans Peter: *See—*
Hochmuth, Walter; and Hollfelder, Hans Peter, 4,074,949, Cl. 407-114.000.
Hollingsead-Pryor Enterprises, Inc.: *See—*
Hollingsead, Robert Allen; Kuchler, Abraham; and Pryor, Clyde Robert, 4,075,444, Cl. 200-51.090.
Hollingsead, Robert Allen; Kuchler, Abraham; and Pryor, Clyde Robert, to Hollingsead-Pryor Enterprises, Inc. Electrical connector structure. 4,075,444, Cl. 200-51.090.
Holmes, Horace D. Locking thread forming tap. 4,074,950, Cl. 408-220.000.
Holmes, Richard E., to Eli Lilly and Company. Substituted pyrroloquinoxalinones and diones. 4,075,206, Cl. 260-250.0BC.
Holst, Arno; and Kostrzewa, Michael, to Hoechst Aktiengesellschaft. Process for the manufacture of swellable cellulose ethers. 4,075,279, Cl. 536-88.000.
Honeywell G.m.b.H.: *See—*
Engel, Hans O., 4,074,889, Cl. 251-298.000.
Honeywell Inc.: *See—*
Castleman, B. Wayne; and Schluter, Bernard C., 4,075,550, Cl. 324-33.000.
Peterson, Dean M., 4,075,639, Cl. 354-25.000.
Honeywell Information Systems Inc.: *See—*
Calle, Jaime; and Chelberg, Lawrence W., 4,075,686, Cl. 364-200.000.
Honma, Kimiyasu: *See—*
Nemoto, Mitsuo; and Honma, Kimiyasu, 4,075,418, Cl. 179-100.41K.
Hood, Murray C.: *See—*
Daniels, Lawrence H.; Hood, Murray C.; and Burdzinski, Boguslaw, 4,074,487, Cl. 52-236.300.
Hooker Chemicals & Plastics Corporation: *See—*
Mark, Victor; and Zengierski, Leon R., 4,075,238, Cl. 260-458.00C.
Seedorf, Jack H.; Hruda, Robert M.; and Abell, Donald E., 4,075,448, Cl. 200-262.000.
Horanoff, Eugene V., to United States of America, Navy. Low interaction wind tunnel balance. 4,074,567, Cl. 73-147.000.
Horback, William B.: *See—*
Trapasso, Louis E.; and Horback, William B., 4,075,387, Cl. 428-288.000.
Horiie, Shigeki; Asai, Shin-Ichiro; Torikoshi, Takashi; Shirakawa, Kazuhiro; and Handa, Minoru, to Denki Kagaku Kogyo Kabushiki Kaisha. Organolithium polymerization initiators and their preparations. 4,075,253, Cl. 260-665.00R.
Horikawa, Kazuo: *See—*
Iwasa, Masakazu; Horikawa, Kazuo; and Matsumoto, Seiji, 4,075,011, Cl. 96-1.00R.
Horizons Research Incorporated: *See—*
Wainer, Eugene, 4,074,980, Cl. 48-197.00R.
Horowitz, Irving, to Teleglobe Pay-TV System, Inc. Pay television system with synchronization suppression. 4,075,660, Cl. 358-124.000.
Horrocks, Donald L., to Beckman Instruments, Inc. Quench determination in liquid scintillation counting systems. 4,075,480, Cl. 250-328.000.
Hosono, Tsutomu, to Fuji Photo Optical Co., Ltd. Motor drive means for motor driven single lens reflex camera. 4,075,644, Cl. 354-173.000.
Howard, Lawrence F.; Mills, James W.; and Shannon, James L. Carpet cleaning brush. 4,074,385, Cl. 15-180.000.
Howard, Lowell Francis, to International Business Machines Corporation. Method for injecting charge in field effect devices. 4,075,653, Cl. 357-23.000.
Howe, Ralph S., Jr., to Textron, Inc. Locking mechanism for securing a bearing ring or the like to a shaft. 4,074,923, Cl. 308-236.000.
Howton, Craig N.: *See—*
Hunter, Robert O., Jr.; and Howton, Craig N., 4,075,579, Cl. 331-94.50G.
Hruda, Robert M.: *See—*
Seedorf, Jack H.; Hruda, Robert M.; and Abell, Donald E., 4,075,448, Cl. 200-262.000.
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, to Ciba-Geigy Corporation. Microbicidal compositions. 4,075,349, Cl. 424-301.000.
Hudis, Michael I., to Rexnord Inc. Concrete receiver and placer for road paving. 4,074,802, Cl. 198-315.000.
Hudson, Gerald E. Wind power converter. 4,074,951, Cl. 415-2.000.
Hughes Aircraft Company: *See—*
Bilow, Norman; and Gardos, Michael N., 4,075,111, Cl. 252-12.000.
Lynch, David D., Jr.; and Tower, Lee W., 4,075,688, Cl. 364-200.000.
Hulderman, Garry N.; and Winderman, Jay B., to General Dynamics Corporation. Externally biased video detector circuit for limiting clutter and noise in a detected radar signal. 4,075,571, Cl. 329-104.000.
Hundy, Guy Francis: *See—*
Clarke, Robert John; Hundy, Guy Francis; and Zimmern, Bernard, 4,074,957, Cl. 418-195.000.
Hunt, Harold R., to Phillips Petroleum Company. Oxidizing carbon black and use of it in elastomers. 4,075,140, Cl. 260-5.000.
Hunter, Robert O., Jr.; and Howton, Craig N., to Maxwell Laboratories, Inc. Gaseous laser medium and means for excitation. 4,075,579, Cl. 331-94.50G.
Hutchins, Samuel F.: *See—*
Robinson, Glen P., Jr.; Shelton, Samuel V.; and Hutchins, Samuel F.,, 4,074,705, Cl. 126-271.000.
Hutchison, Philip Scott: *See—*
McRae, Dougles Charles; and Hutchison, Philip Scott, 4,075,088, Cl. 209-106.000.
Hydril Company: *See—*
Mott, James D., 4,074,761, Cl. 166-315.000.
Ichimura, Masao: *See—*
Kamo, Yoshihisa; Tachibana, Takeshi; and Ichimura, Masao, 4,075,425, Cl. 179-1.0GQ.
Ideal Toy Corporation: *See—*
Thorn, Herbert; and Berkin, Harvey, 4,074,460, Cl. 46-135.00R.
Idemitsu Kosan Co., Ltd.: *See—*
Narita, Yoshihiro; Mochizuki, Shigeaki; Kakimoto, Shigeru; Komori, Norio; Watanabe, Kiyoshi; and Shiota, Hideji, 4,074,864, Cl. 241-23.000.
Igaki, Hiroyuki; Shibata, Yoshiki; and Saruyama, Masao, to Toray Industries, Inc. Method and apparatus for determining total oxygen demand of combustible materials in aqueous dispersion. 4,074,973, Cl. 23-230.0PC.
Igarashi, Tsuyoshi: *See—*
Furukawa, Yasuhiko; and Igarashi, Tsuyoshi, 4,075,381, Cl. 428-192.000.
Ihara, Nobuyuki: *See—*
Kurahasi, Yutaka; and Ihara, Nobuyuki, 4,074,632, Cl. 104-130.000.
Iijima, Yukihiko; Iinuma, Kazumoto; and Ishiguro, Tatsuo, to Nippon Electric Co., Ltd. Composite feedback predictive code communication system for a color TV signal including a carrier chrominance signal. 4,075,655, Cl. 358-13.000.
Iinuma, Kazuhiro: *See—*
Takamizawa, Kinya; Itamura, Einoshin; and Iinuma, Kazuhiro, 4,075,598, Cl. 340-1.00R.
Iinuma, Kazumoto: *See—*
Iijima, Yukihiko; Iinuma, Kazumoto; and Ishiguro, Tatsuo, 4,075,655, Cl. 358-13.000.
Ikeya, Taro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Manifold reactor. 4,074,524, Cl. 60-282.000.
Iles, Michael Victor: *See—*
Underwood, Michael John; Martin, Michael Joseph; and Iles, Michael Victor, 4,075,424, Cl. 179-1.0SG.
Imperial Chemical Industries Limited: *See—*
Drewe, Nigel Wyndham; Parker, Roger John; and Tadros, Tharwat Fouad, 4,075,002, Cl. 71-92.000.
Knowles, David Alan; and Robson, Clive Gilroy, 4,075,005, Cl. 71-94.000.
Lewis, John Didwith, 4,075,511, Cl. 307-270.000.
Perelman, Arthur, 4,074,707, Cl. 126-343.50A.
Ridyard, Denis Robert Annesley, 4,075,200, Cl. 260-206.000.
Inaba, Shigeho: *See—*
Sasajima, Kikuo; Ono, Keiichi; Motoike, Yasuo; Inaba, Shigeho; and Yamamoto, Hisao, 4,075,346, Cl. 424-267.000.
Inagaki, Kazunori: *See—*
Takahata, Fumio; Inagaki, Kazunori; and Hirata, Yasuo, 4,075,429, Cl. 179-15.0BM.
Inagaki, Kenji: *See—*
Furuta, Tadaaki; Inagaki, Kenji; Mizoguchi, Yoshiyuki; Fujikawa, Noboru; and Kominami, Naoya, 4,075,100, Cl. 210-266.000.
Incoterm Corporation: *See—*
Gorgens, Richard A., 4,075,460, Cl. 235-420.000.
Indra, Jaromir, to Vysoke uceni technicke. Discharge valve for injection pumps of internal combustion engines. 4,074,668, Cl. 123-139.0AF.
Industrial Electronics Service Co.: *See—*
Cieslak, Richard F.; and Balding, John V., 4,075,625, Cl. 340-384.00E.
Ingenieursbureau Dwars, Heederik en Verhey B.V.: *See—*
Budde, Antonius Wilhelmus Hermanus; and Wiggers, Johannes Bernardus Maria, 4,074,953, Cl. 416-183.000.
Inman, Johnny K. Emergency fire net. 4,074,791, Cl. 182-138.000.
Inooka, Masayoshi: *See—*
Morimoto, Tatsuo; Nakamura, Munekazu; Inooka, Masayoshi; and Yawata, Teizaburo, 4,075,125, Cl. 252-455.00R.
Inoue, Morio: *See—*
Umebachi, Shotaro; Kano, Gota; and Inoue, Morio, 4,075,652, Cl. 357-22.000.
Inoue, Nobuyoshi; and Shimizu, Munetaka, to Copal Company Limited. Electric shutter means equipped with a self-timer mechanism. 4,075,648, Cl. 354-238.000.
Inoue, Yoshio: *See—*
Takamizawa, Minoru, Yamamoto, Yasushi; Inoue, Yoshio; Noshiro, Atsumi; and Fujii, Hitoshi, 4,075,167, Cl. 260-46.50E.
Institut de Recherches de la Siderurgie Francaise (IRSID): *See—*
Trevedy, Jean-Louis, 4,075,035, Cl. 136-210.000.
Institut Francais du Petrole: *See—*
Grehier, Alain, 4,075,396, Cl. 429-17.000.
Institute of Gas Technology: *See—*
Burns, David J.; Mohaupt, Udo H.; and Yie, Gene G., 4,074,858, Cl. 239-172.000.

International Business Machines Corporation: *See*—
Cheatham, Samuel David; and Lewkowicz, Julian, 4,075,671, Cl. 360-113.000.
Ciszek, Theodore Frank; and Schwuttke, Guenter Herbert, 4,075,055, Cl. 156-608.000.
Eichelberger, Edward Baxter; Muehldorf, Eugen Igor; Walther, Ronald Gene; and Williams, Thomas Walter, 4,074,851, Cl. 235-302.000.
Fox, Joel Lawrence; and Marquardt, Eugene Everett, 4,075,693, Cl. 364-200.000.
Galetto, Louis Valentine; Meier, Johann Hans; Pimbley, Walter Thornton; and Wolfe, Bruce Allen, 4,075,636, Cl. 346-75.000.
Howard, Lowell Francis, 4,075,653, Cl. 357-23.000.
Rideout, Vincent L., 4,075,045, Cl. 148-187.000.
Walker, Ernest L., 4,075,582, Cl. 333-72.000.
Walker, Ernest Lee, 4,075,577, Cl. 331-17.000.

International Computers Limited: *See*—
Martin, Michael Joseph; and Underwood, Michael John, 4,075,423, Cl. 179-1.0SC.
Underwood, Michael John; Martin, Michael Joseph; and Iles, Michael Victor, 4,075,424, Cl. 179-1.0SG.

International Nickel Company, Inc., The: *See*—
Fischer, John Joseph, 4,075,010, Cl. 75-235.000.
Kosalos, James George; and Cooke, Robert William, 4,075,599, Cl. 340-3.00R.

International Telephone and Telegraph Corporation: *See*—
Reines, Jose, 4,075,430, Cl. 179-18.00J.

Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., to Eastman Kodak Company. Bichromophoric benzoxazole-styrene ultraviolet stabilizers and their use in organic compositions. 4,075,162, Cl. 260-45.8NZ.

Irick, Gether, Jr.; and Kelly, Charles A., to Eastman Kodak Company. Benzotriazole benzoate ultraviolet stabilizers. 4,075,220, Cl. 260-308.00B.

Isaoka, Shin-ichi: *See*—
Kawakami, Shigenao; Shibata, Tatsumi; Isaoka, Shin-ichi; and Shintani, Tutomu, 4,075,183, Cl. 260-79.3MU.

Ishiguro, Ginya: *See*—
Suzuki, Hideo; Ishiguro, Ginya; Mitsuhashi, Sadayuki; and Wakamatsu, Kazutoshi, 4,075,587, Cl. 335-112.000.

Ishiguro, Tatsuo: *See*—
Iijima, Yukihiko; Iinuma, Kazumoto; and Ishiguro, Tatsuo, 4,075,655, Cl. 358-13.000.

Ishikawa, Hisao: *See*—
Sawaki, Mikio; Iwataki, Isao; Hirono, Yoshihiko; and Ishikawa, Hisao, 4,075,239, Cl. 260-464.000.

Ishikawa, Masakazu: *See*—
Kondo, Toshio; Ishikawa, Masakazu; Katagiri, Masayoshi; and Kizaki, Jiro, 4,074,795, Cl. 188-73.300.

Ishikawa, Toshikatsu; Junichi, Tanaka; Teranishi, Haruo; and Kondo, Shinichiro, to Nippon Carbon Co., Ltd. Flexible graphite material containing boric acid. 4,075,114, Cl. 252-62.000.

Itamura, Einoshin: *See*—
Takamizawa, Kinya; Itamura, Einoshin; and Iinuma, Kazuhiro, 4,075,598, Cl. 340-1.00R.

Ito, Takayuki: *See*—
Kojima, Masaharu; Ogawa, Hiroshi; Maeda, Minoru; Nitta, Kazuo; and Ito, Takayuki, 4,075,334, Cl. 424-238.000.

Itoh, Kametaro: *See*—
Ueno, Masakatsu; Kato, Osamu; Kawauchi, Nobuyuki; and Itoh, Kametaro, 4,075,041, Cl. 148-12.400.

Itoh, Kunio; Takago, Toshio; Sato, Tamio; and Aoki, Hisashi, to Shin-Etsu Chemical Co., Ltd. Room-temperature curing organopolysiloxane compositions. 4,075,154, Cl. 260-37.0SB.

Ivanov, Vladimir Alexandrovich: *See*—
Glikman, Mark Leonovich; Sapunar, Zakhar Isaevich; Avrus, Albert Vladimirovich; Gorokhovsky, Vladilen Alexandrovich; Fainberg, Evgeny Borisovich; Ivanov, Vladimir Alexandrovich; Shirkevich, Tatyana Leonidovna; and Sizov, Vadim Mikhailovich, 4,074,994, Cl. 65-44.000.

Iwasa, Masakazu; Horikawa, Kazuo; and Matsumoto, Seiji, to Fuji Photo Film Co., Ltd. Electrostatic powder coating method. 4,075,011, Cl. 96-1.00R.

Iwasaki, Hikoji: *See*—
Sakaguchi, Mitsuo; Iwasaki, Hikoji; and Shimoya, Shigeo, 4,075,626, Cl. 340-388.000.

Iwataki, Isao: *See*—
Sawaki, Mikio; Iwataki, Isao; Hirono, Yoshihiko; and Ishikawa, Hisao, 4,075,239, Cl. 260-464.000.

J. I. Case Company: *See*—
Frisbee, Claude M., 4,074,769, Cl. 172-804.000.
Frisbee, Claude M., 4,074,770, Cl. 172-804.000.
Long, Elton B., 4,074,821, Cl. 214-138.00R.
Lourigan, Patrick M.; and Khatti, Ramkishan, 4,074,528, Cl. 60-422.000.

J. M. Huber Corporation: *See*—
Fitton, Robert Charles; and Fiore, Barbara Ann, 4,075,280, Cl. 423-118.000.

Jablonski, Edward R., to Appleton Electric Company. Cam operated toggle for securing a light fixture or the like to a tube. 4,074,941, Cl. 403-260.000.

Jachna, Waclaw: *See*—
Jedo, Antoni; and Jachna, Waclaw, 4,075,090, Cl. 209-173.000.

Jackson, William M. Steering and propulsion device for watercraft. 4,074,652, Cl. 115-35.000.

Jacob, Hermann. Method and apparatus for comminuting sand clods. 4,074,867, Cl. 241-30.000.

Jacobson, Arthur F.: *See*—
Jacobson, Sidney I.; Jacobson, Harold D.; and Jacobson, Arthur F., 4,074,451, Cl. 40-610.000.

Jacobson, Harold D.: *See*—
Jacobson, Sidney I.; Jacobson, Harold D.; and Jacobson, Arthur F., 4,074,451, Cl. 40-610.000.

Jacobson, Sidney I.; Jacobson, Harold D.; and Jacobson, Arthur F. Display device. 4,074,451, Cl. 40-610.000.

Jaeger, Frederick T., to Eutectic Corporation. Boiler tube coating and method for applying the same. 4,075,376, Cl. 428-36.000.

Jaeger, Frederick T., to Eutectic Corporation. Alloy-coated ferrous metal substrate. 4,075,392, Cl. 428-457.000.

Jager, Hans; and Seipp, Emil, to S.A. Metallurgie Hoboken-Overpelt N.V. Method of producing a siliceous cover layer on a semiconductor element by centrifugal coating utilizing a mixture of silica emulsions. 4,075,044, Cl. 148-175.000.

Jahn, Gerhard: *See*—
Pauli, Gunter; and Jahn, Gerhard, 4,075,507, Cl. 307-117.000.

Jakob, Herbert E.; and Garbelman, David L., to CMI Corporation. Apparatus for producing hot mix asphalt utilizing recyclable asphalt aggregate. 4,075,710, Cl. 366-25.000.

James, Lawrence W., to Varian Associates, Inc. High speed FET employing ternary and quarternary III-V active layers. 4,075,651, Cl. 357-22.000.

Janko, Bozidar, to Tektronix, Inc. Electron beam forming structure utilizing an ion trap. 4,075,533, Cl. 315-31.00R.

Jansen, Johannes H.: *See*—
Hoffman, Neil R.; and Jansen, Johannes H., 4,074,910, Cl. 280-289.00R.

Jansen, William David: *See*—
Link, William Trevor; Rugge, Henry Ferdinand; and Jansen, William David, 4,074,711, Cl. 128-2.05A.

Jansson, Bror Ingvar Erling. Device for preventing the flow of air through an opening between two rooms or spaces. 4,074,620, Cl. 98-36.000.

Jansson, Conny Erik, to AB Bahco Verktyg. Pliers. 4,074,597, Cl. 81-417.000.

Janus, Jurgen Peter. Wall structures. 4,074,538, Cl. 61-47.000.

Japan Atomic Energy Research Institute: *See*—
Muromura, Tadasumi, 4,075,306, Cl. 423-352.000.
Sakurada, Ichiro; Okada, Toshio; and Hirano, Yutaka, 4,075,075, Cl. 204-159.170.

Japan Storage Battery Company Limited: *See*—
Furukubo, Haruo; Takezi, Yasaburo; and Takatuka, Kenzi, 4,075,530, Cl. 313-229.000.

Jardinier, Pierre; Simonnot, Jack; and Lecerf, Robert, to Societe d'Etudes et de Recherches de Ventilation et d'Aeraulique. Adjustable flow air insufflation nozzle. 4,074,862, Cl. 239-515.000.

Jarm, Robert L., to Credit Industry Associates, Inc. Lock extractor. 4,074,410, Cl. 29-265.000.

Javick, Richard A.: *See*—
Ferraro, Charles F.; Javick, Richard A.; and Robertson, James A., 4,075,369, Cl. 427-185.000.

Jedo, Antoni; and Jachna, Waclaw, to Centralny Osrodek Projektowo-Konstrukcyjny Maszyn Gorniczych "Komag". Apparatus for gravity collecting and handling of products from tanks filled with liquid for dewatering devices. 4,075,090, Cl. 209-173.000.

Jegen, James M.: *See*—
Magers, Wallace F.; and Jegen, James M., 4,074,861, Cl. 239-492.000.

Jencks, Charles L.: *See*—
Castonguay, Roger N.; and Jencks, Charles L., 4,075,584, Cl. 335-20.000.

Jenkins Metal Corporation: *See*—
Jenkins, Robert B., Jr.; and Poindexter, Jack A., 4,074,391, Cl. 19-107.000.

Jenkins, Robert B., Jr.; and Poindexter, Jack A., to Jenkins Metal Corporation. Crush roll plenum for carding machines. 4,074,391, Cl. 19-107.000.

Jenoptik Jena G.m.b.H.: *See*—
Quillfeldt, Winfried, 4,075,537, Cl. 315-354.000.

Jensen, John Frank. Fireplace stove. 4,074,679, Cl. 126-121.000.

Jermyn, Arthur C. Orally receptive holder for a dental x-ray film paquette. 4,075,494, Cl. 250-479.000.

Jernow, Jane Liu; and Rosen, Perry, to Hoffmann-La Roche, Inc. Process for preparing substituted 2,4-diaminopyrimidines and isoxazole intermediate. 4,075,209, Cl. 260-256.40N.

Jewsbury, (Charles) Bill (William): *See*—
Harris, Richard K.; Jewsbury, (Charles) Bill (William); and Shoup, Dale W., 4,074,565, Cl. 73-88.50R.

Joh. A. Benckiser GmbH: *See*—
Walch, Axel; Klimmek, Albrecht; and Wollmann, Klaus, 4,075,093, Cl. 210-23.00H.

Johansson, Ake Ernst Elof; and Pahlen, Lars Christer, to Telefonaktiebolaget L M Ericsson. Rack for circuit boards. 4,075,683, Cl. 361-415.000.

Johnson, Arthur F., to R.C.M. Corporation. Process for the removal of sulfur oxides by the use of activated alumina. 4,075,284, Cl. 423-244.000.

Johnson, Bruce K., to Polaroid Corporation. Exposure counter and flash inhibiting means for a photographic apparatus. 4,075,647, Cl. 354-217.000.

Johnson, Dudley B.: *See*—
Hanni, Stephen L.; and Johnson, Dudley B., 4,074,419, Cl. 29-625.000.

Johnson, Joseph E.: *See*—
Tarneja, Krishan S.; Johnson, Joseph E.; and Bartko, John, 4,075,037, Cl. 148-1.500.

Johnson, Leslie Harold; Lo, David Shih-Fang; and Paul, Maynard Carlton, to Sperry Rand Corporation. Rounded serrated edge film strip geometry for cross-tie wall memory system. 4,075,612, Cl. 365-171.000.

Johnson, Matthey & Co., Limited: *See*—
Gibbon, Alan, 4,074,865, Cl. 241-24.000.

Johnson, Paul H., to Phillips Petroleum Company. Production of non-carcinogenic large particle carbon black. 4,075,156, Cl. 260-42.470.

Johnson, Paul H., to Phillips Petroleum Company. Production of non-carcinogenic carbon black. 4,075,157, Cl. 260-42.470.

Johnson, Paul H.: *See*—
Mills, King L.; and Johnson, Paul H., 4,075,160, Cl. 260-42.470.

Johnson, Walter G. Machine for shredding leaves and garden debris. 4,074,869, Cl. 241-55.000.

Johnston, James J., to Automatic Equipment Development Corporation. Electrical connector having releasably retained latch tab assembly. 4,074,928, Cl. 339-91.00R.

Jones, C. David; and Suarez, Tulio, to Eli Lilly and Company. Antifertility compounds. 4,075,227, Cl. 260-330.500.

Jones, C. David: *See*—
Suarez, Tulio; and Jones, C. David, 4,075,223, Cl. 260-326.50C.

Jones, Clifton Martin. Tennis ball napper. 4,074,403, Cl. 26-29.00R.

Jones, Kenneth James, to Lucas Electrical Company Limited. Lamp assembly. 4,075,471, Cl. 362-300.000.

Jones, Lewis O.: *See*—
Berg, Allan C.; Fitzpatrick, John W.; and Jones, Lewis O., 4,075,391, Cl. 428-407.000.

Jones, Rufus S., Jr.; Tan, Marshall; and Choe, Eui Won, to Celanese Corporation. Process for producing wholly aromatic polyamide fibers of high strength. 4,075,269, Cl. 264-184.000.

Jonsson, Bjorn Erik Rutger; Andersson, Ulf Ivan Gunnar; and Bergman, Gustav Ruben, to Telefonaktiebolaget L M Ericsson. Method of and arrangement for detecting faults in a memory device. 4,075,466, Cl. 235-302.300.

Jonsson, Gregg N., to Thor Power Tool Company. Torquing tool control circuit. 4,074,772, Cl. 173-12.000.

Jorg, Helmut. Arrangement for cooling a lubricant-filled, finned gear case by means of a built-in fan. 4,074,590, Cl. 74-606.00A.

Jorgensen, Erik; Roy, Dibyendu N.; and Kondo, Edward S., to Canadian Patents and Development Limited. Method for the treatment of trees subject to Dutch elm disease. 4,075,327, Cl. 424-273.00R.

Jorgenson, Clyde R.; DeBoer, Harold M.; and Jorgenson, Ronald M., to Acoustical Floors, Inc. Floor preparation and method. 4,075,374, Cl. 427-355.000.

Jorgenson, Ronald M.: *See*—
Jorgenson, Clyde R.; DeBoer, Harold M.; and Jorgenson, Ronald M., 4,075,374, Cl. 427-355.000.

Josam Manufacturing Co.: *See*—
Polster, Norman E., 4,074,530, Cl. 60-518.000.

Josse, Rene, to Hoffmann-La Roche, Inc. Stable injectable vitamin compositions. 4,075,333, Cl. 424-237.000.

Joubert, Jerauld D., to Steiger Tractor Inc. Self locking compartment for tractor. 4,074,786, Cl. 180-68.500.

Joubert, Jerauld D., to Steiger Tractor Inc. Tractor door latch. 4,074,788, Cl. 180-89.120.

Joy Manufacturing Company: *See*—
Morrison, Ward D., 4,074,771, Cl. 173-6.000.

Joyce, James V. Mining apparatus and method for an augered seam. 4,074,920, Cl. 299-18.000.

Joyce, John E. Method of and apparatus for use in generating liquid concentration gradients hydrostatically. 4,074,687, Cl. 137-266.000.

Joyeux, Didier: *See*—
Genequand, Pierre; and Joyeux, Didier, 4,075,535, Cl. 313-422.000.

Jozwiak, Edward L., Jr.; and Das, Suryya K., to PPG Industries, Inc. Method and resinous vehicles for electrodeposition. 4,075,135, Cl. 260-29.7DP.

Judt, Friedrich: *See*—
Taubert, Klaus; Benner, Reimund; and Judt, Friedrich, 4,074,518, Cl. 59-15.000.

Juergens, David A.; and Terek, Greg P., to Rubbermaid Commercial Products Inc. Combination tiered letter tray and vertical file. 4,074,810, Cl. 211-11.000.

Jun, Choll K.: *See*—
Economy, James; Jun, Choll K.; and Lin, Ruey Y., 4,075,276, Cl. 264-332.000.

Junichi, Tanaka: *See*—
Ishikawa, Toshikatsu; Junichi, Tanaka; Teranishi, Haruo; and Kondo, Shinichiro, 4,075,114, Cl. 252-62.000.

Jurca, Milos, to CKD Praha, oborovy podnik. Contactless facilities for determining the specific resistance of a test sample. 4,075,557, Cl. 324-62.000.

Kabushiki Kaisha Audio-Technica: *See*—
Nemoto, Mitsuo; and Honma, Kimiyasu, 4,075,418, Cl. 179-100.41K.

Kabushiki Kaisha Daini Seikosha: *See*—
Asano, Kazuhiro, 4,074,515, Cl. 58-23.0BA.
Kondo, Kenichi, 4,074,516, Cl. 58-38.00R.
Tatsumi, Yoshio; and Kadowaki, Tooru, 4,074,517, Cl. 58-140.00R.
Torisawa, Akira, 4,075,540, Cl. 318-138.000.

Kabushiki Kaisha Kobe Seikosho: *See*—
Nohara, Tomiyasu; Matsuno, Yoshiyuki; Harada, Hisamitsu; and Yamada, Akinori, 4,074,440, Cl. 34-92.000.

Kabushiki Kaisha Meidensha: *See*—
Ochiai, Tomoyoshi; Hayashi, Takeshi; and Furuse, Mituhiro, 4,075,697, Cl. 364-481.000.

Kabushiki Kaisha Mitutoyo Seisakusho: *See*—
Takeda, Yasuo, 4,074,438, Cl. 33-174.00P.

Kabushiki Kaisha Suwa Seikosha: *See*—
Futagawa, Yoshikiyo; Kubota, Kanemitsu; and Kamakura, Hiroshi, 4,075,623, Cl. 340-347.0NT.

Kadin, Saul B., to Pfizer Inc. Anti-allergenic 5-alkoxyimidazo[1,2-A]quinoline-2-carboxylic acids and derivatives thereof. 4,075,343, Cl. 424-258.000.

Kadowaki, Koju; Takagi, Kenji; and Tanaka, Yoshiaki, to Mitsubishi Petrochemical Company Limited. Catalyst for production of α,β-unsaturated carboxylic acids. 4,075,127, Cl. 252-470.000.

Kadowaki, Tooru: *See*—
Tatsumi, Yoshio; and Kadowaki, Tooru, 4,074,517, Cl. 58-140.00R.

Kagami, Teruo: *See*—
Kikuchi, Shoji; Endo, Takaya; Kagami, Teruo; and Sato, Ryosuke, 4,075,021, Cl. 96-95.000.

Kaganov, July Davydovich: *See*—
Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Kudryakov, Mikhail Nikolaevich; Tsipkis, Alexandr Moiseevich; Yakovlev, Vladimir Germogenovich; Averbukh, Alexandr Samoilovich; Scherbakov, Jury Ilich; Yakobson, Natalia Dmitrievna; Semikozov, Vyacheslav Fedorovich; Medvedev, Viktor Vladimirovich; Yartsev, Valery Vasilievich; Kaganov, July Davydovich; Kuznetsov, Vladimir Ivanovich; and Sinelnikov, Alexandr Iosifovich, 4,074,773, Cl. 173-23.000.

Kagerhuber, Franz: *See*—
Scheurecker, Werner; and Kagerhuber, Franz, 4,074,746, Cl. 164-442.000.

Kaiser Steel Corporation: *See*—
Daniels, Lawrence H.; Hood, Murray C.; and Burdzinski, Boguslaw, 4,074,487, Cl. 52-236.300.

Kaisler, Francis J.: *See*—
Folsom, Gary J.; and Kaisler, Francis J., 4,074,930, Cl. 350-33.000.
Wells, H. David; Folsom, Gary J.; and Kaisler, Francis J., 4,074,964, Cl. 8-10.200.

Kakimoto, Shigeru: *See*—
Narita, Yoshihiro; Mochizuki, Shigeaki; Kakimoto, Shigeru; Komori, Norio; Watanabe, Kiyoshi; and Shiota, Hideji, 4,074,864, Cl. 241-23.000.

Kakiuchi, Hiroshi: *See*—
Koyama, Tsuneo; Sugiyama, Yuichi; Furuhama, Teruhide; Tajima, Yoshio; Kakiuchi, Hiroshi; Yamada, Kazuhiro; and Obara, Masaaki, 4,075,159, Cl. 260-42.470.

Kakuta, Susumu: *See*—
Hayashi, Hideaki; and Kakuta, Susumu, 4,074,873, Cl. 242-75.430.

Kali und Salz Aktiengesellschaft: *See*—
Kunze, Dietmar; and Kirchner, Siegfried, 4,075,309, Cl. 423-497.000.

Kalliokoski, Aarno Iisakki: *See*—
Saari, Kaarlo Matti Juhani; and Kalliokoski, Aarno Iisakki, 4,075,089, Cl. 209-169.000.

Kamakura, Hiroshi: *See*—
Futagawa, Yoshikiyo; Kubota, Kanemitsu; and Kamakura, Hiroshi, 4,075,623, Cl. 340-347.0NT.

Kamiyama, Norio: *See*—
Shibata, Takehiko; Ando, Tadahiko; Kitsunai, Tokuji; Kamiyama, Norio; and Oikawa, Yoshifumi, 4,075,062, Cl. 195-103.50R.

Kamo, Yoshihisa; Tachibana, Takeshi; and Ichimura, Masao, to Nippon Columbia Kabushikikaisha. Multi-directional sound signal reproducing system. 4,075,425, Cl. 179-1.0GQ.

Kamper, Egbert B., to Kamper's Woodfire Co., Inc. Heating apparatus. 4,074,854, Cl. 236-11.000.

Kamper's Woodfire Co., Inc.: *See*—
Kamper, Egbert B., 4,074,854, Cl. 236-11.000.

Kane, Alfred J. Fabricated disc filter core. 4,075,103, Cl. 210-331.000.

Kano, Gota: *See*—
Umebachi, Shotaro; Kano, Gota; and Inoue, Morio, 4,075,652, Cl. 357-22.000.

Kanto Ishiseiyaku Co., Ltd.: *See*—
Kondo, Yasunori, 4,075,336, Cl. 424-246.000.

Kao Soap Co., Ltd.: *See*—
Murata, Moriyasu; Yamanaka, Makoto; and Fujino, Takashi, 4,075,129, Cl. 252-527.000.

Kapaun, Gustav: *See*—
Fuchs, Hermann; Kapaun, Gustav; and Meininger, Fritz, 4,074,967, Cl. 8-54.000.

Kaplan, Leopold S. Method and device for facilitating double-contrast studies of the upper gastrointestinal tract. 4,074,709, Cl. 128-2.00A.

Kaplan, Martin; and Tassone, Joseph V., to Compo Industries, Inc. Lasting machine with latex adhesive delivery. 4,074,383, Cl. 12-145.000.

Kaplan, Ronald M.: *See*—
Beane, David J.; and Kaplan, Ronald M., 4,074,559, Cl. 72-354.000.

Kappel, Gary. Stereo speaker system. 4,075,438, Cl. 179-146.02H.

Karkoski, Joseph; McGregor, Charles William; and Payette, Lionel Joseph, to Essex International, Inc. Polyesterimides and processes for preparing same. 4,075,179, Cl. 260-75.00N.

Karl Kroyer St. Anne's Limited: *See*—
Curry, Harold George; Attwood, Brian William; and White, Derek Graham Walter, 4,074,959, Cl. 425-81.100.

Hicklin, Denis Raymond; and Attwood, Brian William, 4,074,393, Cl. 19-303.000.

Karlin, Alexandr Vasilievich: *See—*
Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.

Karstensen, Karl W.; and Smith, Brace C., to Caterpillar Tractor Co. Speed sensor mounting for a gas turbine. 4,075,562, Cl. 324-173.000.

Karstetter, Bruce R.: *See—*
Ackerman, Roger G.; and Karstetter, Bruce R., 4,074,993, Cl. 65-30.00E.

Kartocol Anstalt: *See—*
Gennari, Luigi, 4,074,618, Cl. 93-49.00M.

Kasuga, Akira: *See—*
Suzuki, Masaaki; and Kasuga, Akira, 4,075,384, Cl. 428-212.000.

Katagiri, Masayoshi: *See—*
Kondo, Toshio; Ishikawa, Masakazu; Katagiri, Masayoshi; and Kizaki, Jiro, 4,074,795, Cl. 188-73.300.

Kates, Willard A., to W. A. Kates Company, The. Readily disassemblable fluid flow rate controller. 4,074,693, Cl. 137-454.600.

Katner, Allen S.; Gutowski, Gerald E.; and Miller, Jean C., to Eli Lilly and Company. Preparation of leurosidine and novel leurosidine 4'-ethers and esters. 4,075,214, Cl. 260-287.00B.

Kato, Akira: *See—*
Hashimoto, Hiroshi; Abe, Tetsuo; and Kato, Akira, 4,074,425, Cl. 29-813.000.

Kato, Koichi: *See—*
Takahashi, Takeshi; Yamazaki, Yoshio; and Kato, Koichi, 4,075,405, Cl. 536-1.000.

Kato, Osamu: *See—*
Ueno, Masakatsu; Kato, Osamu; Kawauchi, Nobuyuki; and Itoh, Kametaro, 4,075,041, Cl. 148-12.400.

Kaufman, Marshall. Film retrieval device. 4,074,870, Cl. 242-1.000.

Kauzal, Gabriel Peter. Veterinary lick preparation. 4,075,325, Cl. 424-140.000.

Kawabata, Yoichi; and Machida, Minoru, to Canon Kabushiki Kaisha. Calculator for determining cubic roots. 4,075,705, Cl. 364-752.000.

Kawaguchiko Seimitsu Co., Ltd.: *See—*
Sato, Hitoshi; Watanabe, Hazime; Miura, Kazumasa; and Kudo, Koji, 4,074,457, Cl. 43-113.000.

Kawakami, Hiroshi; Tsukagawa, Yukio; and Nagaoka, Isao, to Bridgestone Tire Company Limited. Suction device for an oil separation tank. 4,075,096, Cl. 210-96.00R.

Kawakami, Hiroshi: *See—*
Sawachika, Yasumasa; Kawakami, Hiroshi; and Minegishi, Shuzo, 4,075,137, Cl. 260-2.5AT.

Kawakami, Shigenao; Shibata, Tatsumi; Isaoka, Shin-ichi; and Shintani, Tutomu, to Sumitomo Chemical Company, Limited. Preparation of water-soluble high polymers. 4,075,183, Cl. 260-79.3MU.

Kawakatsu, Hisazo: *See—*
Okayama, Shigeo; and Kawakatsu, Hisazo, 4,075,488, Cl. 250-396.00R.

Kawasaki, Masahiro: *See—*
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; and Kawasaki, Masahiro, 4,075,641, Cl. 354-43.000.

Kawauchi, Nobuyuki: *See—*
Ueno, Masakatsu; Kato, Osamu; Kawauchi, Nobuyuki; and Itoh, Kametaro, 4,075,041, Cl. 148-12.400.

Kayaba Industry Co., Ltd.: *See—*
Chano, Takashi; and Masuda, Kohji, 4,074,640, Cl. 112-121.110.

Kazuo, Arai, to Nissan Denshi Kabushikikaisha. Single side-band wave generation system. 4,075,565, Cl. 325-138.000.

Keach, Bernard C., to Educational Electronics of California Inc. Digital logic control for audio visual programs and method therefor. 4,075,668, Cl. 360-80.000.

Kedzierski, Stanley G., to Textron, Inc. Slider for slide fastener. 4,074,399, Cl. 24-205.14R.

Keishin Matsumoto: *See—*
Shibata, Takanori; and Marumoto, Katsuji, 4,075,541, Cl. 318-139.000.

Kella, Harry Y. Utility security blanket. 4,074,375, Cl. 5-336.000.

Keller, George M. Method for producing cast-in-place pipe employing permanent pipe mold. 4,075,300, Cl. 264-32.000.

Keller, James R.; and Nickerson, William A., to Wm. A. Nickerson & Co., Ltd. Fabricated wood beam. 4,074,498, Cl. 52-690.000.

Kelley Company, Inc.: *See—*
Miller, Benjamin U., 4,074,638, Cl. 110-8.00R.

Kelly, Charles A.: *See—*
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,075,162, Cl. 260-45.8NZ.
Irick, Gether, Jr.; and Kelly, Charles A., 4,075,220, Cl. 260-308.00B.

Kelly, Ralph; and Ritter, Edmond Jean, to Cincinnati Milacron, Inc. Skin protective compositions. 4,075,318, Cl. 424-70.000.

Kemmler, Lothar, to Samson AG. Fluidic switch. 4,074,701, Cl. 137-625.660.

Kempf, Gerhard, to Evolution SA. Thread monitoring switch for textile machines having magnet biasing lever to prevent any annoying thread flutter. 4,075,445, Cl. 200-61.180.

Kenbudge Holdings Limited: *See—*
Baikie, Hugh E., 4,074,909, Cl. 280-11.120.

Kendall Company, The: *See—*
Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., 4,074,714, Cl. 128-218.00P.
Smits, Donald M.; Daley, Patrick J.; and Akerley, Arnold J., 4,074,721, Cl. 128-461.000.

Kennedy, Howard L.; and Ooms, John, to Motorola, Inc. Incremental AGC signal generator with controllable increments. 4,075,573, Cl. 330-129.000.

Keren, Eitan; and Brown, Harold J., to Sealed Air Corporation. Method and apparatus for packaging articles. 4,074,505, Cl. 53-28.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Ringel, Helmut, 4,075,104, Cl. 210-402.000.

Kerr, George T.; and Schweizer, Albert E., to Mobil Oil Corporation. Reaction of beta platinum chloride with gaseous ammonia. 4,075,307, Cl. 423-413.000.

Kerr-McGee Chemical Corporation: *See—*
Thomas, David Charles, 4,075,032, Cl. 106-303.000.

Kershaw, Joseph E., to United States of America, Navy. Low loss tuneable filter. 4,075,583, Cl. 333-73.00R.

Kessel, Bernhard. Manually closable anti-backup trap. 4,074,686, Cl. 137-247.190.

Kessler, Theodore P., to Timron, Inc. Lock plate for an arm of a pile fabric reel frame. 4,074,874, Cl. 242-77.100.

Ketterer, Stanley Joseph; and Weisz, William, to Singer Company, The. Rail-bearing for rotary shuttles. 4,074,643, Cl. 112-181.000.

Khatti, Ramkishan: *See—*
Lourigan, Patrick M.; and Khatti, Ramkishan, 4,074,528, Cl. 60-422.000.

Kieserling & Albrecht Werkzeugmaschinenfabrik: *See—*
Weck, Karl-Gustav, 4,074,598, Cl. 82-20.000.

Kikuchi, Shoji; Endo, Takaya; Kagami, Teruo; and Sato, Ryosuke, to Konishiroku Photo Industry Co., Ltd. Photosensitive material for color photography. 4,075,021, Cl. 96-95.000.

Kikuchi, Takeshi: *See—*
Mizuno, Yukio; Kikuchi, Takeshi; and Kojima, Shuichi, 4,074,728, Cl. 139-435.000.

Kilbourn, Edward E.; Peardon, David L.; and Ware, J. Edgar, to Rohm and Haas Company. 3-Pyridylmethyl aryl urea rodenticides compositions. 4,075,345, Cl. 424-263.000.

Killen, Denis: *See—*
Dockray, Edward; and Killen, Denis, 4,074,960, Cl. 425-89.000.

Kimel, Esfir Abramovna: *See—*
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Zimnukhov, Viktor Alexandrovich; Miroshnikova, Lidia Alexeevna; Kimel, Esfir Abramovna; Chefranova, Edit Konstantinovna; Guseva, Valentina Ivanovna; and Masagutova, Ljudmila Vladimirovna, 4,075,166, Cl. 260-45.95H.

Kindersley, Peter G. Drafting template. 4,074,437, Cl. 33-41.00B.

King Industries, Inc.: *See—*
Gallacher, Lawrence V., 4,075,176, Cl. 260-67.60R.

King, John: *See—*
Korbelak, Alexander; and King, John, 4,075,065, Cl. 204-43.00G.

King-Seely Thermos Co.: *See—*
Beck, Willi K., 4,075,593, Cl. 337-312.000.

Kirchner, Siegfried: *See—*
Kunze, Dietmar; and Kirchner, Siegfried, 4,075,309, Cl. 423-497.000.

Kirschbaum, Robert N. Method for the treatment of essential oils and wood particles containing essential oils. 4,075,071, Cl. 204-136.000.

Kishimoto, Jotaro: *See—*
Noguchi, Yukihide; Nishimura, Takeshi; Kishimoto, Jotaro; and Nishida, Yoshio, 4,074,654, Cl. 118-73.000.

Kiss, Kornel Dezso, to Dart Industries, Inc. Stabilized polyolefin compositions. 4,075,146, Cl. 260-23.00H.

Kitamura, Ko; Watanabe, Mamoru; Watanabe, Yojiro; and Seto, Yutaka, to Konishiroku Photo Industry Co., Ltd. Fixing device for an electrophotographic copying machine. 4,075,455, Cl. 219-216.000.

Kitsunai, Tokuji: *See—*
Shibata, Takehiko; Ando, Tadahiko; Kitsunai, Tokuji; Kamiyama, Norio; and Oikawa, Yoshifumi, 4,075,062, Cl. 195-103.50R.

Kiuru, Erkki Sakari: *See—*
Sipila, Heikki Johannes; and Kiuru, Erkki Sakari, 4,075,486, Cl. 250-374.000.

Kizaki, Jiro: *See—*
Kondo, Toshio; Ishikawa, Masakazu; Katagiri, Masayoshi; and Kizaki, Jiro, 4,074,795, Cl. 188-73.300.

Klahr, Carl N. Radiation reflecting building. 4,074,482, Cl. 52-171.000.

Klank, Otto; and Rottmann, Dieter, to Licentia Patent-Verwaltungs-G.m.b.H. Broadcast receiver tuning circuit with station memory. 4,075,567, Cl. 325-453.000.

Klauke, Erich: *See—*
Kuhle, Engelbert; Klauke, Erich; and Eue, Ludwig, 4,075,235, Cl. 260-453.0RW.

Klebansky, Alexandr Leibovich: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Rymareva, Tatyana Ivanovna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; and Alexeevs, Ljubov Antonovna, 4,075,168, Cl. 260-46.50R.

Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.

Kleiner, Eduard K.; and Knell, Martin, to Geigy Chemical Corporation. Perfluorinated esters of fumaric acid and certain other ethylenically unsaturated poly-basic acid and soil repellant polymers thereof. 4,075,237, Cl. 260-455.00R.

Klett, Keith K. Emergency lighting system. 4,075,503, Cl. 307-66.000.

Klimmek, Albrecht: *See*—
Walch, Axel; Klimmek, Albrecht; and Wollmann, Klaus, 4,075,093, Cl. 210-23.00H.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Meder, Heinz, 4,074,866, Cl. 241-30.000.

Klockner-Werke AG: *See*—
Grisar, Ulrich; and Berstermann, Wilhelm, 4,074,936, Cl. 356-81.000.

Kluge, Albert D.: *See*—
Cina, Ronald A.; and Kluge, Albert D., 4,074,744, Cl. 164-187.000.

Klugmann, Nathan: *See*—
Mermelstein, Shmuel; and Klugmann, Nathan, 4,074,658, Cl. 119-82.000.

Knapp, Paul William, Jr., to American Cyanamid Company. Alkyl allophanates, method for preparation and fungicidal use of the same. 4,075,348, Cl. 424-300.000.

Knell, Harvey A.: *See*—
Gill, Stephen H.; Knell, Harvey A.; and Tucker, Joseph M., III, 4,074,820, Cl. 214-138.00R.

Knell, Martin: *See*—
Kleiner, Eduard K.; and Knell, Martin, 4,075,237, Cl. 260-455.00R.

Knill, Kenneth George; Bowler, Michael Kendal; and Hambleton, Peter, to Charcon Products Limited. Consolidation of particulate materials. 4,075,027, Cl. 106-99.000.

Knodel, Emil: *See*—
Nonnemacher, Gerhard; Knodel, Emil; Robeller, Walter; and Bosch, Paul, 4,074,955, Cl. 417-218.000.

Knoll, Frank: *See*—
Spinosa, Dominic J.; and Knoll, Frank, 4,074,401, Cl. 24-236.000.

Knowles, David Alan; and Robson, Clive Gilroy, to Imperial Chemical Industries Limited. Herbicidal compositions. 4,075,005, Cl. 71-94.000.

Knox, John E. Device for holding flexible, yieldable information carriers. 4,074,453, Cl. 40-352.000.

Knox, Michael A.; and Powers, Mary. Wiping material and holder. 4,075,033, Cl. 134-6.000.

Kobayashi, Isao; Asada, Yoshiharu; and Kumakawa, Shiro, to Teijin Limited. Method for drawing and heat-treating polyester yarns. 4,075,274, Cl. 264-290.00T.

Kobishi Electric Co., Ltd.: *See*—
Sakaguchi, Mitsuo; Iwasaki, Hikoji; and Shimoya, Shigeo, 4,075,626, Cl. 340-388.000.

Koch, Heinz; Pawlowicz, Manfred; and Brams, Bernhard, to Fried Krupp Huttenwerke AG. Process and means for grinding out faults in the surface of a work piece. 4,074,982, Cl. 51-92.00R.

Koehler, Dale R.; Sagarino, Robert F.; and Sauter, Charles A., to Bulova Watch Company, Inc. Micro-miniature stepping motor. 4,075,518, Cl. 310-49.00R.

Koelle, Alfred R.: *See*—
Baldwin, Howard A.; Depp, Steven W.; Koelle, Alfred R.; and Freyman, Robert W., 4,075,632, Cl. 343-6.80R.

Koenig & Bauer Aktiengesellschaft: *See*—
Eck, Norbert Otto; Stark, Siegfried Alfons; and Wieland, Erich Georg, 4,074,627, Cl. 101-425.000.

Koenig, Harry J., to United States of America, Navy. Multiple-channel data switch. 4,075,608, Cl. 340-166.00R.

Kogre, Inc.: *See*—
Myers, John D.; and Vollers, Charles S., 4,075,120, Cl. 252-301.40P.

Koh-I-Noor Rapidograph, Inc.: *See*—
Anderka, Gerold; and Kuparinen, Lasse, 4,074,414, Cl. 29-509.000.

Kohama, Tokio: *See*—
Obayashi, Hideki; Kohama, Tokio; Hattori, Tadashi; and Nishida, Minoru, 4,074,566, Cl. 73-116.000.

Kohkoku Chemical Industry Co., Ltd.: *See*—
Sawachika, Yasumasa; Kawakami, Hiroshi; and Minegishi, Shuzo, 4,075,137, Cl. 260-2.5AT.

Kohls, E. Eugene: *See*—
Grossman, Leroy W.; Collins, Jack; and Kohls, E. Eugene, 4,074,379, Cl. 9-1.600.

Kohnhorst, Earl E., to Brown & Williamson Tobacco Corporation. Smokable tobacco products and manufacturing methods therefor. 4,074,722, Cl. 131-8.00R.

Koinuma, Tokuju: *See*—
Saito, Hisao; Tashiro, Norio; and Koinuma, Tokuju, 4,075,534, Cl. 315-39.710.

Kojima, Masaharu; Ogawa, Hiroshi; Maeda, Minoru; Nitta, Kazuo; and Ito, Takayuki, to Mallinckrodt, Inc. 6β-Iodomethyl-19-norcholest-5(10)-en-3β-ol and compositions containing same. 4,075,334, Cl. 424-238.000.

Kojima, Shuichi: *See*—
Mizuno, Yukio; Kikuchi, Takeshi; and Kojima, Shuichi, 4,074,728, Cl. 139-435.000.

Kojima, Takafumi: *See*—
Mukaemachi, Takuji; Takeshita, Tetsuo; Miyoshi, Tatsuru; and Kojima, Takafumi, 4,075,431, Cl. 179-18.0GF.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Takahata, Fumio; Inagaki, Kazunori; and Hirata, Yasuo, 4,075,429, Cl. 179-15.0BM.
Wada, Tasaku, 4,075,539, Cl. 318-135.000.

Kolesnikova, Galina Prokofievna: *See*—
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Zimnukhov, Viktor Alexandrovich; Miroshnikova, Lidia Alexeevna; Kimel, Esfir Abramovna; Chefranova, Edit Konstantinovna; Guseva, Valentina Ivanovna; and Masagutova, Ljudmila Vladimirovna, 4,075,166, Cl. 260-45.95H.

Kolev, Konstantin Nikolaev: *See*—
Burov, Atanas Tzvetanov; Simidchieva, Penka Atanassova; and Kolev, Konstantin Nikolaev, 4,075,016, Cl. 96-48.0PD.

Kollberg, Ture Eric, to American Defibrator, Inc. Screw conveyor having stopper bar means. 4,074,803, Cl. 198-670.000.

Komanduri, Rangachary; and Shaw, Milton C., to Carnegie-Mellon University. Process for nucleating diamonds. 4,074,471, Cl. 51-295.000.

Komatsu, Toshiyoshi, to Duskin Franchise Co. Ltd. Cleaning material and process for preparation thereof. 4,075,375, Cl. 427-390.00R.

Kominami, Naoya: *See*—
Furuta, Tadaaki; Inagaki, Kenji; Mizoguchi, Yoshiyuki; Fujikawa, Noboru; and Kominami, Naoya, 4,075,100, Cl. 210-266.000.

Komori, Norio: *See*—
Narita, Yoshihiro; Mochizuki, Shigeaki; Kakimoto, Shigeru; Komori, Norio; Watanabe, Kiyoshi; and Shiota, Hideji, 4,074,864, Cl. 241-23.000.

Kondo, Edward S.: *See*—
Jorgensen, Erik; Roy, Dibyendu N.; and Kondo, Edward S., 4,075,327, Cl. 424-273.00R.

Kondo, Kenichi, to Kabushiki Kaisha Daini Seikosha. Alarm electronic timepiece. 4,074,516, Cl. 58-38.00R.

Kondo, Shinichiro: *See*—
Ishikawa, Toshikatsu; Junichi, Tanaka; Teranishi, Haruo; and Kondo, Shinichiro, 4,075,114, Cl. 252-62.000.

Kondo, Toshio; Ishikawa, Masakazu; Katagiri, Masayoshi; and Kizaki, Jiro, to Aisin Seiki Kabushiki Kaisha. Caliper mounting arrangement for a disc brake. 4,074,795, Cl. 188-73.300.

Kondo, Yasunori, to Kanto Ishiseiyaku Co., Ltd. Thiazines and method. 4,075,336, Cl. 424-246.000.

Kondo, Yoshihiko, to Nippondenso Co., Ltd. Electric circuit for selecting operational conditions of load. 4,075,501, Cl. 307-41.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Kikuchi, Shoji; Endo, Takaya; Kagami, Teruo; and Sato, Ryosuke, 4,075,021, Cl. 96-95.000.
Kitamura, Ko; Watanabe, Mamoru; Watanabe, Yojiro; and Seto, Yutaka, 4,075,455, Cl. 219-216.000.

Konno, Kazuhiko; Hayasi, Yosio; Taniyama, Eiji; and Sekiya, Tetsuo, to Mitsubishi Petrochemical Company Limited. Wood preservatives and method for wood preservation treatment. 4,075,121, Cl. 252-407.000.

Kontes Glass Company: *See*—
Kontes, James Constantine, 4,074,824, Cl. 215-365.000.

Kontes, James Constantine, to Kontes Glass Company. Container for storage and shipment of chemical standards, radioactive isotopes and the like. 4,074,824, Cl. 215-365.000.

KOPAT Gesellschaft fur Konstruktion, Entwicklung und Patentverwertung m.b.H. & Co. KG: *See*—
Ritter, Kaspar, 4,074,891, Cl. 254-150.0FH.

Korbelak, Alexander; and King, John, to Handy & Harman. Gold plating bath and process. 4,075,065, Cl. 204-43.00G.

Kornfeld, Edmund C.; and Bach, Nicholas J., to Eli Lilly and Company. 8-Aryl-9-ergolenes. 4,075,213, Cl. 260-285.500.

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Bach, Nicholas J.; and Kornfeld, Edmund C., 4,075,212, Cl. 260-285.500.

Kosalos, James George; and Cooke, Robert William, to International Nickel Company, Inc., The. Undersea geophysical exploration. 4,075,599, Cl. 340-3.00R.

Kosovtsev, Vladimir Vasilievich: *See*—
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Zimnukhov, Viktor Alexandrovich; Miroshnikova, Lidia Alexeevna; Kimel, Esfir Abramovna; Chefranova, Edit Konstantinovna; Guseva, Valentina Ivanovna; and Masagutova, Ljudmila Vladimirovna, 4,075,166, Cl. 260-45.95H.

Kostrzewa, Michael: *See*—
Holst, Arno; and Kostrzewa, Michael, 4,075,279, Cl. 536-88.000.

Kotzin, Bernard, Jr. Chair and detachable locker. 4,074,918, Cl. 297-192.000.

Kowalski, Gunter, to U.S. Philips Corporation. Device for measuring radiation absorption in a layer of a body. 4,075,490, Cl. 250-445.00T.

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Meyer-Ebrecht, Dietrich; and Kowalski, Gunter, 4,075,484, Cl. 250-366.000.

Koyama, Tsuneo; Sugiyama, Yuichi; Furuhama, Teruhide; Tajima, Yoshio; Kakiuchi, Hiroshi; Yamada, Kazuhiro; and Obara, Masaaki, to Yokohama Rubber Co., Ltd., The. Rubber compositions with benzoic acid compounds. 4,075,159, Cl. 260-42.470.

Koziar, Joseph C.: *See*—
Lane, Constance A.; and Koziar, Joseph C., 4,075,263, Cl. 260-873.000.

Kozlowski, George J.: *See*—
Beaver, John R.; and Kozlowski, George J., 4,074,431, Cl. 30-353.000.
Kraft, Inc.: *See*—
Roland, John F., 4,075,195, Cl. 260-119.000.
Kramer, Carl; Stein, Heinrich; and Gerhardt, Hans Joachim. Method and apparatus for floatation conveyance of strip materials. 4,074,841, Cl. 226-97.000.
Kratzer, Brice L. X-ray computer. 4,074,850, Cl. 235-89.00R.
Kraus, Heinz, to Dr. Johannes Heidenhain GmbH. Electron-optically radiatable structure. 4,075,497, Cl. 250-505.000.
Kraus, James R.; and Murphy, Howard C., to Pennsylvania Wire Rope Corporation. Cable fastener assembly. 4,074,945, Cl. 403-197.000.
Kray, Raymond J., to Ciba-Geigy Corporation. N-Cyanosulfonamide resins and intermediates therefor and products thereof. 4,075,185, Cl. 260-79.30M.
Kreighbaum, William E.; and Comer, William T., to Mead Johnson & Company. 3-Alkoxyisoquinolines for hypotensive and vasodilating effects. 4,075,344, Cl. 424-258.000.
Krider, Paul Robert, to AMP Incorporated. Cable card edge connector. 4,074,929, Cl. 339-97.00R.
Krug, John A., to ACF Industries, Incorporated. Sampling assembly for taking a sample of liquid at a desired level in a tank. 4,074,577, Cl. 73-421.00B.
Kruger, Gunter: *See*—
Kuttner, Klaus; Kruger, Gunter; and Modic, Fedor, 4,075,416, Cl. 174-68.500.
Krulewich, Edward B., to General Electric Company. Defrost sensing system for freezer compartment. 4,074,987, Cl. 62-128.000.
Krupka, Richard W. Lawn edging. 4,074,479, Cl. 52-102.000.
Kruse, Hubert; and Sommer, Karl, to Hoechst Aktiengesellschaft. Stable monoazo dyestuff. 4,074,965, Cl. 8-41.00R.
Kuboshima, Makoto: *See*—
Munakata, Tsuneaki; and Kuboshima, Makoto, 4,075,645, Cl. 354-187.000.
Kubota, Kanemitsu: *See*—
Futagawa, Yoshikiyo; Kubota, Kanemitsu; and Kamakura, Hiroshi, 4,075,623, Cl. 340-347.0NT.
Kuchler, Abraham: *See*—
Hollingsead, Robert Allen; Kuchler, Abraham; and Pryor, Clyde Robert, 4,075,444, Cl. 200-51.090.
Kudo, Koji: *See*—
Sato, Hitoshi; Watanabe, Hazime; Miura, Kazumasa; and Kudo, Koji, 4,074,457, Cl. 43-113.000.
Kudryakov, Mikhail Nikolaevich: *See*—
Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Kudryakov, Mikhail Nikolaevich; Tsipkis, Alexandr Moiseevich; Yakovlev, Vladimir Germogenovich; Averbukh, Alexandr Samoilovich; Scherbakov, Jury Ilich; Yakobson, Natalia Dmitrievna; Semikozov, Vyacheslav Fedorovich; Medvedev, Viktor Vladimirovich; Yartsev, Valery Vasilievich; Kaganov, July Davydovich; Kuznetsov, Vladimir Ivanovich; and Sinelnikov, Alexandr Iosifovich, 4,074,773, Cl. 173-23.000.
Kufner, Kenneth L.: *See*—
Deshich, Dushan C.; Chmela, Frank P.; and Kufner, Kenneth L., 4,074,424, Cl. 29-753.000.
Kuhle, Engelbert; Klauke, Erich; and Eue, Ludwig, to Bayer Aktiengesellschaft. N-Aryl-urea compounds and herbicidal compositions. 4,075,235, Cl. 260-453.0RW.
Kulbakh, Valter Osvaldovich: *See*—
Bashkovich, Alexandr Pavlovich; Zimnukhova, Evgenia Semenovna; Prokopovich, Agnessa Vladimirovna; Polatovskaya, Olga Grigorievna; Pronina, Maria Ivanovna; Kulbakh, Valter Osvaldovich; Rivkina-Pevtsova, Khasya Ionovna; and Grinberg, Grigory Efimovich, 4,075,322, Cl. 424-94.000.
Kumakawa, Shiro: *See*—
Kobayashi, Isao; Asada, Yoshiharu; and Kumakawa, Shiro, 4,075,274, Cl. 264-290.00T.
Kunig, Helmut; and Reinke, Klaus, to Hanseatischer Maschinenbau G.m.b.H. Apparatus for depositing a sliver in a sliver can. 4,074,394, Cl. 19-159.00R.
Kunz, Walter: *See*—
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,075,349, Cl. 424-301.000.
Kunze, Dietmar; and Kirchner, Siegfried, to Kali und Salz Aktiengesellschaft. Process for the production of highly concentrated magnesium chloride solutions. 4,075,309, Cl. 423-497.000.
Kuparinen, Lasse: *See*—
Anderka, Gerold; and Kuparinen, Lasse, 4,074,414, Cl. 29-509.000.
Kupko, Viktor Semenovich: *See*—
Bryzzhev, Lev Dmitrievich; and Kupko, Viktor Semenovich, 4,074,576, Cl. 73-702.000.
Kurahasi, Yutaka; and Ihara, Nobuyuki, to SI Handling Systems, Inc. Switch for monorail track with rotary drive shaft. 4,074,632, Cl. 104-130.000.
Kurasawa, Makoto, to Taiwan Ricoh Co., Ltd. Multi-exposure device for camera. 4,075,646, Cl. 354-209.000.
Kurisu, Shingo; Oyamoto, Toshiya; Ochiai, Setumi; Miyamoto, Hiromu; and Makino, Katsuaki, to Mitsubishi Jukogyo Kabushiki Kaisha. Thermal decomposition apparatus. 4,074,979, Cl. 48-111.000.
Kurumada, Tomoyuki: *See*—
Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, 4,075,165, Cl. 260-45.80N.
Kussel, Willy: *See*—
Weirich, Walter; and Kussel, Willy, 4,074,695, Cl. 137-508.000.
Kusumoto, Tadao: *See*—
Shinoda, Nobuhiko; and Kusumoto, Tadao, 4,075,696, Cl. 364-404.000.
Kuttner, Klaus; Kruger, Gunter; and Modic, Fedor, to Robert Bosch GmbH. Electronic thin film circuit unit and method of making the same. 4,075,416, Cl. 174-68.500.
Kuyama, Hiroshi; and Higosaki, Nobuyuki, to Rohm and Haas Company. Fungicidal/algicidal composition for non-medical uses. 4,075,326, Cl. 424-141.000.
Kuznetsov, Vladimir Ivanovich: *See*—
Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Kudryakov, Mikhail Nikolaevich; Tsipkis, Alexandr Moiseevich; Yakovlev, Vladimir Germogenovich; Averbukh, Alexandr Samoilovich; Scherbakov, Jury Ilich; Yakobson, Natalia Dmitrievna; Semikozov, Vyacheslav Fedorovich; Medvedev, Viktor Vladimirovich; Yartsev, Valery Vasilievich; Kaganov, July Davydovich; Kuznetsov, Vladimir Ivanovich; and Sinelnikov, Alexandr Iosifovich, 4,074,773, Cl. 173-23.000.
Kuzuo, Tooze: *See*—
Fukuda, Hiroshi; and Kuzuo, Tooze, 4,075,442, Cl. 200-16.00F.
Kwok, Clyde Chi Kai; and Cornellier, Joseph Rene, to Cornellier, Joseph Rene. Liquid supply system and nozzle for jet weaving looms. 4,074,727, Cl. 139-435.000.
Kwoon Kwen Metal Ware Company Limited: *See*—
Yee, Li Sze, 4,074,549, Cl. 70-7.000.
L. F. Lang & Son Pools Inc.: *See*—
Lang, Robert S.; Post, Rodney Morris; and Hogan, Thomas Leo, 4,074,481, Cl. 52-169.800.
Labe, Jacob, III. Multi-purpose closure for containers. 4,074,827, Cl. 220-23.000.
Labofina S.A.: *See*—
Van Doorne, Guy Camille, 4,075,112, Cl. 252-35.000.
Van Doorne, Guy Camille, 4,075,113, Cl. 252-35.000.
Laboratorium fur Adsorptionstechnik GmbH: *See*—
Storp, Klaus; Wirth, Hans; Rittinger, Gunter; and Hohmann, Volker, 4,075,282, Cl. 423-230.000.
Labourre, Abel S. Elevatable two-part scaffold for picking fruit. 4,074,819, Cl. 214-83.100.
Lacefield, William B., to Eli Lilly and Company. Method of controlling aquatic weeds. 4,074,998, Cl. 71-66.000.
Lacroix, Guy: *See*—
Thizy, Andre; Pillon, Daniel; Debourge, Jean-Claude; and Lacroix, Guy, 4,075,324, Cl. 424-128.000.
Lacroix, Roger; and Haberli, Roland, to Ciba-Geigy Corporation. Stable concentrated liquid preparation of a paper dye of the disazo class. 4,074,966, Cl. 8-41.00R.
Ladd, Floyd R.: *See*—
Schulze, Robert R.; and Ladd, Floyd R., 4,074,717, Cl. 128-303.100.
LaDue, Donn; Winchurch, Robert J.; and Scaife, Gary R., to S & S Research and Electronics. Shutoff apparatus for internal combustion engines. 4,074,672, Cl. 123-198.0DC.
Laenger, Charles J., Sr.; McFarland, Sam R.; and Peel, Harry H., to Southwest Research Institute. Method and apparatus for communicating with people. 4,074,444, Cl. 35-35.00A.
Lafferty, Gary S., Sr., to Milwaukee Electric Tool Corporation. Plug-in brush cartridge. 4,075,523, Cl. 310-239.000.
L'Agence Nationale de Valorisation de la Recherche ANVAR: *See*—
Richaud, Aime A.; Moreno, Pierre F.; and Rimbaud, Guy A., 4,074,585, Cl. 74-424.80R.
Laitram Corporation, The: *See*—
Lapeyre, James M., 4,075,619, Cl. 340-324.00R.
Lake, Larry W.: *See*—
Hill, Harold J.; Reisberg, Joseph; Helfferich, Fred G.; Lake, Larry W.; and Pope, Gary A., 4,074,755, Cl. 166-252.000.
Lakshmanan, Pallavoor R., to Gulf Research & Development Company. Aqueous urea-formaldehyde resin compositions having improved storage life. 4,075,149, Cl. 260-29.40R.
Lamborghini Oleodinamica S.p.A.: *See*—
Menini, Corrado, 4,074,531, Cl. 60-547.000.
Landry, Joseph Gerard. Apparatus for teaching and playing contract bridge. 4,074,442, Cl. 35-8.00B.
Lane, Constance A.; and Koziar, Joseph C., to Rohm and Haas Company. Process for preventing hydrolytic degradation of linear saturated aromatic polyesters comprising a thermoplastic saturated aromatic polyester and a moisture scavenger polymer. 4,075,263, Cl. 260-873.000.
Lane, William P., to Polaroid Corporation. Film-engaging mechanism and transport receptacle therefor. 4,075,643, Cl. 354-86.000.
Lang, Robert J., to Exxon Research & Engineering Co. Process for the production of hydrocarbons from coal. 4,075,079, Cl. 208-8.000.
Lang, Robert S.; Post, Rodney Morris; and Hogan, Thomas Leo, to L. F. Lang & Son Pools Inc. In-ground swimming pool construction. 4,074,481, Cl. 52-169.800.
Lange, Charles F.: *See*—
Ainis, Herman; Lange, Charles F.; Mark, Abraham S.; and Scherr, George H., 4,075,315, Cl. 424-12.000.
Lange, Harold Carl: *See*—
MacLeay, Ronald Edward; Sheppard, Chester Stephen; and Lange, Harold Carl, 4,075,199, Cl. 260-192.000.
Langford, Le Roy: *See*—
Adams, Charles E.; Quackenbush, Harold E.; Harrer, Paul H.; Langford, Le Roy; and Cleek, Alvin L., 4,074,830, Cl. 221-266.000.
Lanier Electronic Laboratory, Inc.: *See*—
Bolick, Fred C., Jr.; Titus, Theodore, IV; and Mohammadioun, Said, 4,075,436, Cl. 179-100.1DR.

Lanz, William E.; and Stepe, Visvaldis A., to Caterpillar Tractor Co. Method of making a loader bucket cutting edge with recessed bolt studs. 4,074,449, Cl. 37-141.00R.

Lapeyre, James M., to Laitram Corporation, The. Remote reading compass display. 4,075,619, Cl. 340-324.00R.

Larionova, Julia Alexeevna: *See*—
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Rymareva, Tatyana Ivanovna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; and Alexeeva, Ljubov Antonovna, 4,075,168, Cl. 260-46.50R.
Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.

Larsen, Larry D., to Patent Development & Management Company. Ionization chamber assembly. 4,075,487, Cl. 250-385.000.

Larson, Kenneth Norman: *See*—
Davis, John Stephen; Larson, Kenneth Norman; and Phalen, Frank William, 4,075,691, Cl. 364-200.000.

Laubengayer, William C., to Rockwell International Corporation. Automatic communication system reconfiguration apparatus. 4,075,440, Cl. 175.3 S-.

Lavins, Paul N., Jr., to American Induction Heating Corporation. Induction heater for forging bar stock. 4,075,450, Cl. 219-10.710.

Lawrence, Jackson, to Cluett, Peabody & Co., Inc. Process for recovery and reuse of ammonia in a liquid ammonia fabric treating system. 4,074,969, Cl. 8-125.000.

Lawrence, John C.; and Roth, Albert, to United States of America, Navy. Variable-to-block-with-prefix source coding technique. 4,075,622, Cl. 340-347.0DD.

Lazier, John K. D.: *See*—
Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 4,075,481, Cl. 250-343.000.

Lazzaretti, Louis G.: *See*—
Capriotti, Alfred J.; Lazzaretti, Louis G.; and O'Donnell, Brian, 4,074,439, Cl. 33-286.000.

Lebecque, Maurice G. N. G. Electrical contact system. 4,074,924, Cl. 339-20.000.

Le Blanc, John R.: *See*—
Burke, William D.; Higginbottom, Harold P.; and Le Blanc, John R., 4,075,403, Cl. 429-253.000.

Lecerf, Robert: *See*—
Jardinier, Pierre; Simonnot, Jack; and Lecerf, Robert, 4,074,862, Cl. 239-515.000.

Lee, Arthur L.; and Coval, Arthur B., to FMC Corporation. Articulated haulage vehicle. 4,074,784, Cl. 180-24.000.

Lee, Gerry A., to Fawn Engineering Corporation. Vending machine having ejector assist member. 4,074,829, Cl. 221-238.000.

Lee, Walter S., to Leemco, Inc. Pressure regulator with soft valve seat. 4,074,694, Cl. 137-505.410.

Lee, William T., to Fishing Tools, Inc. Power swivel. 4,074,775, Cl. 173-79.000.

Leemco, Inc.: *See*—
Lee, Walter S., 4,074,694, Cl. 137-505.410.

Leenhouts, Albert C., to Superior Electric Company, The. Linear velocity change stepping motor circuit. 4,075,544, Cl. 318-696.000.

Legille, Edouard, to S.A. des Anciens Etablissements Paul Wurth. Charge metering apparatus for shaft furnaces. 4,074,816, Cl. 214-2.000.

Legille, Edouard; and Mahr, Rene N., to S.A. des Anciens Etablissements Paul Wurth. Furnace charger with discharge channel having approximate oval cross-section. 4,074,835, Cl. 222-558.000.

Leigh Products, Inc.: *See*—
Antoszewski, Alex Joseph, 4,074,884, Cl. 248-289.00R.

Leinonen, Erkki Ilmari, to Outokumpu Oy. Stabilized voltage source having a series regulator on the alternating-voltage side. 4,075,548, Cl. 323-86.000.

Leland Stanford, Jr. University, The Board of Trustees of: *See*—
Boyd, Douglas P., 4,075,491, Cl. 250-445.00T.

Leland Stanford Junior University, The Board of Trustees of: *See*—
Boyd, Douglas P.; and Goitein, Michael, 4,075,492, Cl. 250-445.00T.

Leike, Helmut, to Raytheon Company. Display processor system. 4,075,695, Cl. 364-200.000.

Leikes, Antony: *See*—
Arato, Paul; Leikes, Antony; and Reid, Larry Ronald, 4,074,387, Cl. 15-322.000.

Lenay, Daniel, to Societe Anonyme des Etablissements Jouvenel & Cordier. Spool valve distributor. 4,074,689, Cl. 137-270.000.

Lenmar Industries, Inc.: *See*—
Cunningham, Richard I.; and Day, Daniel E., 4,074,787, Cl. 180-82.00B.

Lentz, Brian A.: *See*—
Williams, David; Lentz, Brian A.; and Le Veque, Harold E., 4,074,856, Cl. 239-1.000.

Leo, Angelo Frank, to DeSoto, Inc. Corrosion-resistant epoxy-amine chromate-containing primers. 4,075,153, Cl. 260-37.0EP.

Leonard, Ralph William, to United States Steel Corporation. Method for the reclamation of zinc from galvanizing baths. 4,075,008, Cl. 75-86.000.

Lerner, Leonard: *See*—
Omodei-Sale, Amedeo; Consonni, Pietro; and Lerner, Leonard, 4,075,341, Cl. 424-258.000.

Lerner, Leonard J.: *See*—
Sale, Amedeo Omodie; Toia, Emilio; Galliani, Giulio; and Lerner, Leonard J., 4,075,342, Cl. 424-258.000.

Lerner Manufacturing, Inc.: *See*—
Blasnik, William; and Halpert, David, 4,074,838, Cl. 223-85.000.

Le Salver, Robert, to Automobiles Peugeot. Exhaust device for a combustion engine. 4,074,525, Cl. 60-322.000.

Leshem, Adam: *See*—
Cooper, David Eugene; Hendee, Leon Clyde, III; Hill, Walter Guy, Jr.; Leshem, Adam; and Marugg, Martin Lewis, 4,074,814, Cl. 214-1.0BB.

Lester, David Bruce: *See*—
Morse, Norman Bernard; and Lester, David Bruce, 4,075,142, Cl. 260-17.00R.

Leusden, Carl Otto Pels; Stupperich, Robert; and Weber, Hans-Bernd. Large-size plate-shaped building elements and process for making the same. 4,074,494, Cl. 52-606.000.

Leva, Joseph L.: *See*—
Leva, Max; and Leva, Joseph L., 4,075,298, Cl. 261-114.0TC.

Leva, Max; and Leva, Joseph L. Contact towers with leak-proof support of improved plate subassembly. 4,075,298, Cl. 261-114.0TC.

Le Veque, Harold E.: *See*—
Williams, David; Lentz, Brian A.; and Le Veque, Harold E., 4,074,856, Cl. 239-1.000.

Lever Brothers Company: *See*—
Duffin, Bryan, 4,075,110, Cl. 252-8.800.

Levinn, Robert N., to American Thermostat Corporation. Fail safe circuit for heat generating device. 4,075,678, Cl. 361-104.000.

Levy, Chauncey F., Jr.; and Pegis, Richard J., to said Chauncey F. Levy, Jr; by said Richard J. Pegis. Intraocular lens with high magnification. 4,074,368, Cl. 3-13.000.

Levy, Isaac I., to ESB Incorporated. Means of providing pressure relief to sealed galvanic cell. 4,075,398, Cl. 429-56.000.

Lewanoni, Dov. Collapsible container. 4,074,826, Cl. 220-6.000.

Lewis, Bernard L., to United States of America, Navy. Space adaptive coherent sidelobe canceller. 4,075,633, Cl. 343-100.0LE.

Lewis, Charles, Jr.: *See*—
Schuck, James M.; and Lewis, Charles, Jr., 4,075,197, Cl. 260-122.000.

Lewis, Irwin M., to ACF Industries, Incorporated. Control valve for bleeding fluid actuator. 4,074,702, Cl. 137-625.660.

Lewis, Jay L.: *See*—
Brakebill, Harold G.; Lewis, Jay L.; and Asbill, Clarence M., III, 4,074,855, Cl. 236-87.000.

Lewis, John Didwith, to Imperial Chemical Industries Limited. Electronic switches. 4,075,511, Cl. 307-270.000.

Lewis, Kim R.; and Corbett, William H., to NCR Corporation. Single station, plural function printer. 4,074,797, Cl. 197-1.00R.

Lewkowicz, Julian: *See*—
Cheatham, Samuel David; and Lewkowicz, Julian, 4,075,671, Cl. 360-113.000.

Leybold-Heraeus GmbH & Co. KG: *See*—
Thomas, Friedrich Werner, 4,075,414, Cl. 13-13.000.

Li, Hsin Lang; Oswald, Hendrikus Johan; and Liland, Alfred Louis, to Allied Chemical Corporation. Apparatus for texturizing yarn. 4,074,405, Cl. 28-257.000.

Liautaud, James P. Method of making a coil form by injection molding. 4,075,273, Cl. 264-250.000.

Libbey-Owens-Ford Company: *See*—
Hagedorn, Floyd T.; Rahrig, Donald D.; and Revells, Robert G., 4,074,996, Cl. 65-106.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Klank, Otto; and Rottmann, Dieter, 4,075,567, Cl. 325-453.000.

Lieber, Ludwig, to Fritz Eichenauer, Firma. Voltage tapping in electrical heating elements. 4,075,459, Cl. 219-375.000.

Lijewski, Robert R.; and Wiesen, Ernest J., to General Electric Company. Apparatus for controlling and displaying scintillation camera information. 4,075,485, Cl. 250-369.000.

Liland, Alfred Louis: *See*—
Li, Hsin Lang; Oswald, Hendrikus Johan; and Liland, Alfred Louis, 4,074,405, Cl. 28-257.000.

Lin, Kuo-Chuan: *See*—
Tsay, Yaw Jenn; and Lin, Kuo-Chuan, 4,075,063, Cl. 202-234.000.

Lin, Ruey Y.: *See*—
Economy, James; Jun, Choll K.; and Lin, Ruey Y., 4,075,276, Cl. 264-332.000.

Lindbloom, John L., to Christian Services, Inc. Motorized hide-a-bed actuating mechanism. 4,074,371, Cl. 5-13.000.

Lindsay Manufacturing Company: *See*—
Arndt, Kenneth E.; Otto, Lonnie E., Jr.; and Siekmeier, David A., 4,074,783, Cl. 180-14.00R.

Link, Donald F., to Recovery Systems, Inc. Food processing system. 4,074,868, Cl. 241-46.00R.

Link, William Trevor; Rugge, Henry Ferdinand; and Jansen, William David, to American Optical Corporation. Apparatus and process for determining systolic pressure. 4,074,711, Cl. 128-2.05A.

Lipnick, Richard: *See*—
Schneider, Richard A.; Freed, Gerald L.; and Lipnick, Richard, 4,075,699, Cl. 364-492.000.

Lipowski, Stanley A.; Dehn, Joseph W., Jr.; and Retzsch, Clinton E., to

Diamond Shamrock Corporation. Retanning and fatliquoring agent. 4,074,968, Cl. 8-94.220.
Lipschutz, Paul, to Neiman S. A. Cylinder locks having plates. 4,074,551, Cl. 70-364.00R.
Liskey Archectural Mfg. Inc.: *See—*
Ray, George F., III, 4,074,488, Cl. 52-263.000.
Little, Roger G.: *See—*
Neal, William R.; and Little, Roger G., 4,075,489, Cl. 250-401.000.
Litton Business Systems, Inc.: *See—*
Wu, Paul S.; and Reago, Robert V., 4,075,461, Cl. 235-466.000.
Litton Systems, Inc.: *See—*
Walker, Ralph Eldridge, 4,075,478, Cl. 250-231.0SE.
Liu, Daniel Ting Hsiu: *See—*
Campbell, Cyrill John; and Liu, Daniel Ting Hsiu, 4,075,193, Cl. 260-112.00B.
Lloyd, Ronald, to Smith & Nephew Plastics Limited. Melt-embossed polymer film. 4,075,379, Cl. 428-105.000.
Lo, David Shih-Fang: *See—*
Johnson, Leslie Harold; Lo, David Shih-Fang; and Paul, Maynard Carlton, 4,075,612, Cl. 365-171.000.
Lobkov, Vasily Danilovich: *See—*
Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.
Lochridge, Joe Cooper, to Brown & Root, Inc. Method of installing a flexible riser. 4,074,541, Cl. 61-110.000.
Lock, William E.; and Churillo, Charles J. Automated ammunition loading/downloading system. 4,074,610, Cl. 89-34.000.
Lockheed Electronics Co., Inc.: *See—*
Schneider, Richard A.; Freed, Gerald L.; and Lipnick, Richard, 4,075,699, Cl. 364-492.000.
Lode, Tenny D. Digital phase measurement system. 4,075,698, Cl. 364-483.000.
Loest, Kent W.; and Schaefer, John T., to Southwire Company; National Steel Corporation; and Earth Sciences, Inc. Process for the recovery of aluminum from alunite. 4,075,068, Cl. 204-93.000.
Lofdahl, Clyde A., to Raychem Corporation. Method and apparatus for the assembly of jacketed electronic devices. 4,074,420, Cl. 29-628.000.
Lofquist, Robert Alden; and Haylock, John Christopher, to Allied Chemical Corporation. Production of polycaproamide fiber wherein polycaproamide is reacted with phenylene bis-(3-butane-1,2-dicarboxylic anhydride). 4,075,271, Cl. 264-210.00F.
Lomax, John A.; and Martin, William J., to Ampex Corporation. Magnetic tape recorder. 4,075,666, Cl. 360-11.000.
Long, Elton B., to J. I. Case Company. Overcenter backhoe. 4,074,821, Cl. 214-138.00R.
Long, Henry A., Jr.: *See—*
Gross, William G.; Long, Henry A., Jr.; and Yamshak, John R., 4,074,655, Cl. 118-410.000.
Longo, Joseph T.: *See—*
Clarke, John Elwood; Andrews, Austin M., II; Gertner, Edward R.; Longo, Joseph T.; and Pasko, John G., 4,075,043, Cl. 148-171.000.
Lonza, Ltd.: *See—*
Oehrli, Beat; Mettler, Max; and Righetti, Bruno, 4,075,229, Cl. 260-340.000.
Lopez, Ana. Toy ballerina doll. 4,074,459, Cl. 46-47.000.
Lore, Nicola. Anti-chattering, grinding counterbalance device. 4,074,470, Cl. 51-238.00S.
Lorenzen, Cornelius, Jr. Pilfer proof display unit. 4,074,637, Cl. 109-38.000.
Lotz, Lawrence C., to Whirlpool Corporation. Oven door full front viewing panel. 4,074,677, Cl. 126-198.000.
Lourigan, Patrick M.; and Khatti, Ramkishan, to J. I. Case Company. Hydraulic control system with priority flow control. 4,074,528, Cl. 60-422.000.
Louzil, Friedrich; Habelt, Gerhard; and Mrazek, Gustav, to U.S. Philips Corporation. Index marking for a cassette magazine apparatus. 4,075,669, Cl. 360-92.000.
Loveless, John H., to United States of America, Veterans' Affairs. Prosthetic load-lift hook locking mechanism. 4,074,367, Cl. 3-1.100.
Lowe, Lawrence Alfred: *See—*
Beddell, Christopher Raymond; Lowe, Lawrence Alfred; and Wilkinson, Samuel, 4,075,191, Cl. 260-112.5LH.
Lowman, Richard M., Jr., to United States of America, Air Force. Deformable plug for an aircraft engine exhaust nozzle. 4,074,859, Cl. 239-265.330.
Lozinsky, Miron Onufrievich: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Rymareva, Tatyana Ivanovna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; and Alexeeva, Ljubov Antonovna, 4,075,168, Cl. 260-46.50R.
Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.
Lucas Electrical Company Limited: *See—*
Jones, Kenneth James, 4,075,471, Cl. 362-300.000.
Lucas Industries Limited: *See—*
Smith, Trevor Stanley, 4,074,521, Cl. 60-39.28R.
Lucero, Gerald N. Hold-down device for shirts and the like. 4,074,364, Cl. 2-117.000.
Lucifer S.A.: *See—*
Stampfli, Harald, 4,074,699, Cl. 137-625.640.
Luckenbach, Edward C., to Exxon Research & Engineering Co. Open shroud trickle valve. 4,074,691, Cl. 137-382.000.
Lummus Company, The: *See—*
Tsao, Utah, 4,074,660, Cl. 122-32.000.
Lupton, Daniel C.; Vermilion, Donn R.; and Bucher, James L., to Owens-Corning Fiberglas Corporation. Method for producing a bead for a pneumatic tire. 4,075,048, Cl. 156-136.000.
Luthi, Walter, to Heberlein Maschinenfabrik AG. Heating devices for the heat treatment of textile filaments or yarns. 4,074,544, Cl. 68-5.00E.
Luzsicza, Steven O.: *See—*
Snyder, Daniel S.; and Luzsicza, Steven O., 4,075,603, Cl. 340-58.000.
Lynch, David D., Jr.; and Tower, Lee W., to Hughes Aircraft Company. System for addressing and address incrementing of arithmetic unit sequence control system. 4,075,688, Cl. 364-200.000.
Lyng Industrier A-S Leksvikarmatur: *See—*
Saether, Gustav, 4,074,697, Cl. 137-606.000.
Lysikov, Boris Vasilievich; Shabanov, Jury Nikolaevich; Rybakov, Jury Viktorovich; and Svetlova, Valentina Ivanovna. Profiled multielectrode thermocouple. 4,075,036, Cl. 136-225.000.
MacDonald, Harold B., to Thomas Taylor & Sons, Inc. Tipped lace. 4,075,046, Cl. 156-73.100.
Machida, Minoru: *See—*
Kawabata, Yoichi; and Machida, Minoru, 4,075,705, Cl. 364-752.000.
MacIntyre, Peter A.: *See—*
Goldblatt, Lawrence; Weiss, Werner; and MacIntyre, Peter A., 4,074,604, Cl. 83-830.000.
MacLeay, Ronald Edward; Sheppard, Chester Stephen; and Lange, Harold Carl, to Pennwalt Corporation. Tertiary aliphatic alpha-peroxyazo compounds. 4,075,199, Cl. 260-192.000.
MacLeay, Ronald Edward; and Sheppard, Chester Stephen, to Pennwalt Corporation. Preparation of block polymers using polyazo sequential free radical initiators. 4,075,286, Cl. 260-877.000.
Madl, Ronald L.; Simon, Frank J.; and Ortinau, Jerry T., to Ralston Purina Company. Process for reducing combustion product residues in products dried by a direct flame unit. 4,075,358, Cl. 426-465.000.
Maeda, Minoru: *See—*
Kojima, Masaharu; Ogawa, Hiroshi; Maeda, Minoru; Nitta, Kazuo; and Ito, Takayuki, 4,075,334, Cl. 424-238.000.
Maffrand, Jean-Pierre, to Parcor. Thieno [2,3-C] pyridine derivatives and therapeutic composition containing same. 4,075,340, Cl. 424-256.000.
Magers, Wallace F.; and Jegen, James M., to Realex Corporation. Spray pattern control structure and method. 4,074,861, Cl. 239-492.000.
Magiera, David L., to Wicks & Nemer, P.A. Game and apparatus. 4,074,906, Cl. 273-243.000.
Magnavox Company, The: *See—*
Heffron, Charles Buckner, 4,075,661, Cl. 358-166.000.
Maguire, Edward John, Jr.: *See—*
Gault, Terrell Wilson; and Maguire, Edward John, Jr., 4,075,118, Cl. 252-135.000.
Mahr, Rene N.: *See—*
Legille, Edouard; and Mahr, Rene N., 4,074,835, Cl. 222-558.000.
Maingot, John E.: *See—*
Van Bilderbeek, Bernard H.; Maingot, John E.; and Walker, James M., 4,074,912, Cl. 285-39.000.
Maki, Hiroshi: *See—*
Tabana, Minoru; Narisawa, Shizuo; Mitsuno, Tatsuyuki; and Maki, Hiroshi, 4,075,285, Cl. 260-876.00B.
Makino, Katsuaki: *See—*
Kurisu, Shingo; Oyamoto, Toshiya; Ochiai, Setumi; Miyamoto, Hiromu; and Makino, Katsuaki, 4,074,979, Cl. 48-111.000.
Makios, Vassilios: *See—*
Wight, James S.; Chudobiak, Walter J.; and Makios, Vassilios, 4,075,555, Cl. 324-58.50R.
Malchman, Franklin L.; Raddi, William J.; and Sharples, Susan, to ESB Incorporated. Cardiac pacer with rate runaway protection. 4,074,720, Cl. 128-419.0PG.
Malinowski, William J., to Chloride, Incorporated. Smoke detector with means for changing light pulse frequency. 4,075,499, Cl. 250-574.000.
Mallinckrodt, Inc.: *See—*
Kojima, Masaharu; Ogawa, Hiroshi; Maeda, Minoru; Nitta, Kazuo; and Ito, Takayuki, 4,075,334, Cl. 424-238.000.
Wolfangel, Robert G.; and Anderson, Howard A., 4,075,314, Cl. 424-1.000.
Malovik, Vladlen Vasilievich: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Rymareva, Tatyana Ivanovna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous,

Viktor Mikhailovich; Gruz, Boris Efimovich; and Alexeeva, Ljubov Antonovna, 4,075,168, Cl. 260-46.50R.
Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.

Manchem, Limited: *See*—
Turner, John Harry Wallice, 4,075,178, Cl. 260-75.00T.

Mandy, Stephen H.; and Thompson, William D., to Dermatologics for Veterinary Medicine, inc. Process for the treatment of acarid skin infections in animals. 4,075,353, Cl. 424-338.000.

Manly, William A., to Graham Magnetics Incorporated. Magnetic recording members. 4,075,672, Cl. 360-135.000.

Manning, Larry G.; and Zabelka, Richard J., to United States of America, Navy. Fax canister with a bottom burster charge and dispersion control ring. 4,074,628, Cl. 102-6.000.

Mansson, Martin; and Torstenfelt, Ragnar, to Stal-Laval Turbin AB. Combustion chamber for gas turbine. 4,074,520, Cl. 60-39.320.

Manufactura de Articulos para el Hogar "Aurora" S.A. Industrial, Comercial, Inmobiliaria y Financiera: *See*—
Vainer, Ernesto A., 4,074,962, Cl. 431-255.000.

Manufacture de Produits Chimiques Protex: *See*—
Bonnet, Jean-Claude; and Tesson, Gerard, 4,075,177, Cl. 260-75.00T.

Mao, Wei-Wen: *See*—
Szczesniak, Alina Surmacka; and Mao, Wei-Wen, 4,075,357, Cl. 426-332.000.

Marchetti, Michael John; and Szymansky, Edward, Jr., to Sperry Rand Corporation. Auxiliary trimmer assembly. 4,074,427, Cl. 30-34.100.

Marcus, Konrad H., to Prince Corporation. Visor and mirror assembly. 4,075,468, Cl. 362-144.000.

Mares, Frank: *See*—
Woolf, Cyril, deceased; Mares, Frank; and Oxenrider, Bryce C., 4,075,410, Cl. 560-87.000.

Marino, Armando V., to Zenith Radio Corporation. Base-socket system with arc prevention means. 4,075,531, Cl. 313-325.000.

Mark, Abraham S.: *See*—
Ainis, Herman; Lange, Charles F.; Mark, Abraham S.; and Scherr, George H., 4,075,315, Cl. 424-12.000.

Mark, Victor, to General Electric Company. Flame retardant polycarbonate composition. 4,075,164, Cl. 260-45.70S.

Mark, Victor; and Zengierski, Leon R., to Hooker Chemicals & Plastics Corporation. Polyhalobenzylic disulfooxonium compounds. 4,075,238, Cl. 260-458.00C.

Markels, Michael, Jr.: *See*—
Burlingame, Richard D.; and Markels, Michael, Jr., 4,075,370, Cl. 427-216.000.

Marlevi, Aleksander: *See*—
Ghisler, Walter; Marlevi, Aleksander; and Anas, Johan Olof, 4,075,428, Cl. 179-15.0BS.

Marquardt, Eugene Everett: *See*—
Fox, Joel Lawrence; and Marquardt, Eugene Everett, 4,075,693, Cl. 364-200.000.

Marrs, Richard E.: *See*—
Felber, Betty J.; Dauben, Dwight L.; and Marrs, Richard E., 4,074,757, Cl. 166-261.000.

Marsh, Samuel W., III; and Zumwalt, Keith E., Sr., to Owens-Illinois, Inc. Glass container handling. 4,075,086, Cl. 209-73.000.

Marshall, Harry Borden; and Vincent, Donald L., to Domtar Limited. Production of syringealdehyde from hardwood waste pulping liquors. 4,075,248, Cl. 260-600.00R.

Marshall, Kenneth Henry, to Premach Pty. Limited. Apparatus for use in shaping a tubular dental impression accessory. 4,074,436, Cl. 32-49.000.

Marshall, Robert, Jr. Emergency bathroom tissue holder. 4,074,872, Cl. 242-55.540.

Martin, Armand: *See*—
Dunham, Philip N.; Tillyer, John N.; and Martin, Armand, 4,074,977, Cl. 44-38.000.

Martin, James C.: *See*—
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,075,162, Cl. 260-45.8NZ.

Martin, Michael Joseph; and Underwood, Michael John, to International Computers Limited. Sound analyzing apparatus. 4,075,423, Cl. 179-1.0SC.

Martin, Michael Joseph: *See*—
Underwood, Michael John; Martin, Michael Joseph; and Iles, Michael Victor, 4,075,424, Cl. 179-1.0SG.

Martin, Richard L.: *See*—
Redmore, Derek; Outlaw, Benjamin T.; and Martin, Richard L., 4,075,291, Cl. 260-933.000.

Martin, Thom O.: *See*—
Haag, Robert A.; Rousseau, Patrick M.; and Martin, Thom O., 4,075,356, Cl. 426-285.000.

Martin, William J.: *See*—
Lomax, John A.; and Martin, William J., 4,075,666, Cl. 360-11.000.

Marugg, Martin Lewis: *See*—
Cooper, David Eugene; Hendee, Leon Clyde, III; Hill, Walter Guy, Jr.; Leshem, Adam; and Marugg, Martin Lewis, 4,074,814, Cl. 214-1.0BB.

Marumoto, Katsuji: *See*—
Shibata, Takanori; and Marumoto, Katsuji, 4,075,541, Cl. 318-139.000.

Maruyama, Masayuki; Hamada, Yoshitugu; and Yamauchi, Ryoichi, to Riken Piston Ring Kogyo Kabushiki Kaisha. Sulphur and nitrogen treated iron based rotor for rotary piston engine. 4,074,956, Cl. 418-178.000.

Maruyama, Takashi; and Ueno, Katsuji, to Sumitomo Chemical Company, Limited. Process for the production of aromatic polyesters from hydroxybenzoic acid and products thereof. 4,075,173, Cl. 260-47.00C.

Maruzen Sewing Machine Co., Ltd.: *See*—
Matsuda, Kimikazu; and Yamaguchi, Yoshihiro, 4,074,644, Cl. 112-215.000.

Marx, Arthur Friedrich; and Barendse, Nicolaas Cornelis Maria Emanuel, to Gist-Brocades N.V. 16-Dehydro steroids of the androstane series. 4,075,233, Cl. 260-397.300.

Marx, Arthur Friedrich; Verwey, Jan; and Smid, Peter Max, to Gist-Brocades N.V. Methods of combatting bacterial infections in warmblooded animal with cephalsporin R-sulfoxide. 4,075,337, Cl. 424-246.000.

Masagutova, Ljudmila Vladimirovna: *See*—
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Zimnukhov, Viktor Alexandrovich; Miroshnikova, Lidia Alexeevna; Kimel, Esfir Abramovna; Chefranova, Edit Konstantinovna; Guseva, Valentina Ivanovna; and Masagutova, Ljudmila Vladimirovna, 4,075,166, Cl. 260-45.95H.

Masaki, Kenji: *See*—
Tokura, Naomi; Masaki, Kenji; and Nagaisi, Hatuo, 4,074,975, Cl. 23-288.00F.

Maschinenfabrik Benniger AG: *See*—
Schenk, Kurt, 4,074,404, Cl. 28-185.000.

Masevice, Frank V., to Towmotor Corporation. Battery enclosure. 4,074,785, Cl. 180-68.500.

Mason, Burton Hoster; and Feldman, Marvin. Tool system for submergible chamber. 4,074,540, Cl. 61-69.00R.

Massachusetts Institute of Technology: *See*—
Stern, Ernest; Williamson, Richard C.; and Smith, Henry I., 4,075,706, Cl. 364-821.000.

Mastermount Corporation: *See*—
Daly, George W.; and Rucker, Joseph R., 4,074,883, Cl. 248-286.000.

Masuda, Hajime; Takeuchi, Takeshi; Watanabe, Masakatsu; and Tomioka, Yukio, to Hochiki Corporation. Alarm system utilizing cable-TV multi-receiver systems. 4,075,628, Cl. 340-416.000.

Masuda, Kohji: *See*—
Chano, Takashi; and Masuda, Kohji, 4,074,640, Cl. 112-121.110.

Masur, Christian; and Stverak, Vaclav, to Autophon Aktiengesellschaft. Selective calling arrangement. 4,075,564, Cl. 325-55.000.

Matake, Naomasa; Yoshimura, Tadayoshi; and Sato, Kuniaki, to Hitachi Metals, Ltd. Fittings for connecting columns and beams. 4,074,947, Cl. 403-406.000.

Material Distributors Corporation: *See*—
Willdorf, Michael E., 4,075,386, Cl. 428-216.000.

Matsu Kyu Kabushiki Kaisha: *See*—
Fukuda, Hiroshi; and Kuzuo, Tooze, 4,075,442, Cl. 200-16.00F.

Matsuda, Kichiro: *See*—
Ozawa, Shuji; Nakagawa, Yasuo; Matsuda, Kichiro; Nishihara, Toshio; and Yunoki, Hideki, 4,075,172, Cl. 260-47.0CZ.

Matsuda, Kimikazu; and Yamaguchi, Yoshihiro, to Maruzen Sewing Machine Co., Ltd. Feed mechanism for sewing machine. 4,074,644, Cl. 112-215.000.

Matsuda, Yoshio; and Tsubokawa, Yoshitoki, to Yoshida Kogyo Kabushiki Kaisha. Slide fastener tape. 4,074,398, Cl. 24-205.10C.

Matsumoto, Seiji: *See*—
Iwasa, Masakazu; Horikawa, Kazuo; and Matsumoto, Seiji, 4,075,011, Cl. 96-1.00R.

Matsunaga, Tsutomu: *See*—
Nishimura, Kazuhiro; Harada, Jumei; Migita, Tetsuhiko; and Matsunaga, Tsutomu, 4,075,275, Cl. 264-313.000.

Matsuno, Yoshiyuki: *See*—
Nohara, Tomiyasu; Matsuno, Yoshiyuki; Harada, Hisamitsu; and Yamada, Akinori, 4,074,440, Cl. 34-92.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Namoto, Yoshiteru; and Sakumoto, Hideki, 4,075,670, Cl. 360-85.000.
Ohnishi, Masanori, 4,075,395, Cl. 428-542.000.
Shigeta, Junnosuke; and Munehiro, Tomiji, 4,074,605, Cl. 84-1.220.

Matsushita Electric Works, Ltd.: *See*—
Sauer, Hans, 4,075,585, Cl. 335-78.000.
Sauer, Hans, 4,075,586, Cl. 335-79.000.

Matsushita Electronics Corporation: *See*—
Umebachi, Shotaro; Kano, Gota; and Inoue, Morio, 4,075,652, Cl. 357-22.000.

Matt, Richard J., to Textron, Inc. Low-friction fabric bearing. 4,074,512, Cl. 57-140.0BY.

Mattsson, Orjan Mats; and Widl, Walter Herbert Erwin, to Telefonaktiebolaget L M Ericsson. System for phase division multiplex duplex communication over a two-wire circuit between a master terminal and a slave terminal. 4,075,427, Cl. 179-15.0BC.

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Rabl, Carl-Roland, 4,074,939, Cl. 356-206.000.

Maxwell Laboratories, Inc.: *See—*
Hunter, Robert O., Jr.; and Howton, Craig N., 4,075,579, Cl. 331-94.50G.
McBane, Bruce N.: *See—*
Porter, Samuel, Jr.; and McBane, Bruce N., 4,075,141, Cl. 260-17.200.
McCabe Brothers Drilling, Inc.: *See—*
McCabe, William E.; McCabe, Howard W.; and McCabe, Edwin L., 4,074,735, Cl. 141-311.00R.
McCabe, Edwin L.: *See—*
McCabe, William E.; McCabe, Howard W.; and McCabe, Edwin L., 4,074,735, Cl. 141-311.00R.
McCabe, Francis J. Resettable, heat actuatable fire link. 4,074,388, Cl. 16-48.500.
McCabe, Howard W.: *See—*
McCabe, William E.; McCabe, Howard W.; and McCabe, Edwin L., 4,074,735, Cl. 141-311.00R.
McCabe, William E.; McCabe, Howard W.; and McCabe, Edwin L., to McCabe Brothers Drilling, Inc. Grouting tube. 4,074,735, Cl. 141-311.00R.
McCarthy, John J. Food dispenser having door actuated agitators. 4,074,832, Cl. 222-245.000.
McCay, Dariel. Adjustable threshold. 4,074,464, Cl. 49-468.000.
McClung, Charles E.; Schwendeman, James L.; and Salyer, Ival O., to Monsanto Research Corporation. Process for making instant shaped foams. 4,075,265, Cl. 264-53.000.
McCullough, Charles R.; to General Electric Company. Direct current cable with resistivity graded insulation, and a method of transmitting direct current electrical energy. 4,075,421, Cl. 174-120.0SC.
McDougald, Larry R., to Eli Lilly and Company. Coccidiocidal combinations. 4,075,323, Cl. 424-114.000.
McDowell, Jimmy J. Rotary engine. 4,074,522, Cl. 60-39.610.
McFarland, Sam R.: *See—*
Laenger, Charles J., Sr.; McFarland, Sam R.; and Peel, Harry H., 4,074,444, Cl. 35-35.00A.
McFatter, Myron L., to Anchortank, Inc. Welded storage tank construction including a structural fin. 4,074,847, Cl. 228-145.000.
McGonigal, Charles: *See—*
Bloxham, Gordon Foreman; Brezeale, Claude Paren; Cocco, Eugene Raymond; Hardesty, Edwin Charles; Small, Byron Lee; Steinert, Daniel Marion; and McGonigal, Charles, 4,075,299, Cl. 264-25.000.
McGregor, Charles William: *See—*
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McHeffey, Murray Parker, to Extrudart Metal Products, Inc. Multiposition window. 4,074,462, Cl. 49-192.000.
McMath, Connie W.: *See—*
Holler, Richard P.; and McMath, Connie W., 4,074,523, Cl. 60-266.000.
McMillan, Moses W.: *See—*
Rinehart, Kenneth L., Jr.; McMillan, Moses W.; and Sobiczewski, Wojciech, 4,075,339, Cl. 424-250.000.
McMillin, Danny Leon; and Dugan, Larry Mason, to Coors Container Company. Apparatus and methods for inspection of can bodies by use of light. 4,074,809, Cl. 209-75.000.
McRae, Dougles Charles; and Hutchison, Philip Scott, to National Research Development Corporation. Apparatus for grading objects according to size. 4,075,088, Cl. 209-106.000.
McRobbie, Malcolm McKenzie: *See—*
Gilbert, Joseph; McRobbie, Malcolm McKenzie; and Gee, Wilfred, 4,075,637, Cl. 346-153.000.
McShane, Lawrence J., to Eli Lilly and Company. Epimerization process. 4,075,219, Cl. 260-306.70C.
Mead Corporation, The: *See—*
Feliks, James J., 4,074,619, Cl. 93-55.10R.
Mead Johnson & Company: *See—*
Kreighbaum, William E.; and Comer, William T., 4,075,344, Cl. 424-258.000.
Mecklenberg, Frank Howard, to Bird Electronic Corporation. VSWR meter circuit using variable RF attenuator. 4,075,554, Cl. 324-58.00B.
Mectronic Inc.: *See—*
Roberts, Charles; and DeMichele, Ernest, 4,074,670, Cl. 123-119.00E.
Meder, Heinz, to Klockner-Humboldt-Deutz Aktiengesellschaft. Releasable compression device for use with a crushing mill or the like. 4,074,866, Cl. 241-30.000.
Mediglas, Inc.: *See—*
Harmony, George W., III, 4,074,370, Cl. 4-173.00R.
Medvedev, Viktor Vladimirovich: *See—*
Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Kudryakov, Mikhail Nikolaevich; Tsipkis, Alexandr Moiseevich; Yakovlev, Vladimir Germogenovich; Averbukh, Alexandr Samoilovich; Scherbakov, Jury Ilich; Yakobson, Natalia Dmitrievna; Semikozov, Vyacheslav Fedorovich; Medvedev, Viktor Vladimirovich; Yartsev, Valery Vasilievich; Kaganov, July Davydovich; Kuznetsov, Vladimir Ivanovich; and Sinelnikov, Alexandr Iosifovich, 4,074,773, Cl. 173-23.000.
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Melaja, Asko J.; and Hamalainen, Lauri, to Suomen Sokeri Osakeyhtio. Process for making xylose. 4,075,406, Cl. 536-1.000.
Melcher, Franz Josef, to Sartorius-Werke GmbH (und. vorm. Gottinger Praezisionswagenfabrik GmbH). Electromagnetically compensating weighing or dynamometer apparatus. 4,074,781, Cl. 177-212.000.
Mendenhall, Robert L. Asphalt-aggregate recycle. 4,074,894, Cl. 366-7.000.
Menikheim, Virginia C.: *See—*
Anderson, Richard M.; Caviness, Alton L.; Menikheim, Virginia C.; and Silverman, Bernard, 4,075,383, Cl. 428-198.000.
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Merck & Co., Inc.: *See—*
Rokach, Joshua; Atkinson, Joseph G.; and Rooney, Clarence S., 4,075,225, Cl. 260-326.310.
Mermelstein, Shmuel; and Klugmann, Nathan. Turkey loader. 4,074,658, Cl. 119-82.000.
Merritt, George Albert, Jr., to San/Bar Corporation. Key telephone privacy exclusion apparatus. 4,075,434, Cl. 179-99.000.
Merritt, James A., to United States of America, Army. Laser chemistry synthesis of NF_4BF_4. 4,075,072, Cl. 204-157.10R.
Mertzweiller, Joseph K.; and Tenney, Horace M., to Exxon Research & Engineering Co. Hydrogenation of organic compounds. 4,075,251, Cl. 260-638.00B.
Mesaros, Louis, to Produits Chimiques Ugine Kuhlmann. Mixed persalts stable in detergent compositions. 4,075,116, Cl. 252-102.000.
Mess, Richard C., to Dayton Sure-Grip & Shore Company, The. Filler plug for coil insert in concrete slab or panel. 4,074,499, Cl. 52-705.000.
Messerschmidt, Rudolph: *See—*
Snow, Conley H.; and Messerschmidt, Rudolph, 4,074,634, Cl. 105-493.000.
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Metaux Speciaux S.A.: *See—*
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Gravey, Guy; Grolla, Paul; and Roth, Andre, 4,075,278, Cl. 423-55.000.
Mettler, Max: *See—*
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Meyer-Ebrecht, Dietrich; and Kowalski, Gunter, to U.S. Philips Corporation. Device for measuring radiation absorption or emission. 4,075,484, Cl. 250-366.000.
Meyer, Roth & Pastor Maschinenfabrik GmbH: *See—*
Taubert, Klaus; Benner, Reimund; and Judt, Friedrich, 4,074,518, Cl. 59-15.000.
Wust, Toni, 4,075,451, Cl. 219-51.000.
Meyer, Victor E., to Dow Chemical Company, The. Process of inhibiting tannin migration in tannin-containing wood substrates. 4,075,394, Cl. 428-537.000.
Meyerand, Russell G., Jr.: *See—*
Bullis, Robert H.; Meyerand, Russell G., Jr.; and Wiegand, Walter J., Jr., 4,074,572, Cl. 73-194.00F.
Meyers, Norman W.: *See—*
Rapson, W. Howard; Fredette, Maurice C. J.; and Meyers, Norman W., 4,075,308, Cl. 423-478.000.
Meyn, Pieter. Fowl gizzard separator. 4,074,390, Cl. 17-11.000.
Michaels, Edwin B. Antimicrobial compositions employing certain betaines and certain amine oxides. 4,075,350, Cl. 424-316.000.
Migita, Tetsuhiko: *See—*
Nishimura, Kazuhiro; Harada, Jumei; Migita, Tetsuhiko; and Matsunaga, Tsutomu, 4,075,275, Cl. 264-313.000.
Mihulka, Merle C., to Essex Group, Inc. Wire stripping apparatus. 4,074,596, Cl. 81-9.510.
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Dolhyj, Serge R.; Milberger, Ernest C.; and White, James F., 4,075,231, Cl. 260-346.400.
Zagata, Robert J.; and Milberger, Ernest C., 4,075,232, Cl. 260-346.750.
Miles, Bernard. Apparatus for forming, interleaving and dispensing food patties. 4,074,509, Cl. 53-122.000.
Miller, Benjamin U., to Kelley Company, Inc. Apparatus for agitating and removing non-combustible material from an incinerator. 4,074,638, Cl. 110-8.00R.
Miller, Douglas P., to Applied Power Inc. Fluid operated hydraulic pump. 4,074,612, Cl. 91-290.000.
Miller, Jean C.: *See—*
Katner, Allen S.; Gutowski, Gerald E.; and Miller, Jean C., 4,075,214, Cl. 260-287.00B.
Miller, Orville C.: *See—*
Sauer, Louis E.; and Miller, Orville C., 4,074,595, Cl. 76-107.00C.
Millhollan, Michael Scott; and Reinschmidt, Robert Michael, to Motorola, Inc. On-chip voltage source for integrated circuits. 4,075,609, Cl. 365-154.000.
Mills, James W.: *See—*
Howard, Lawrence F.; Mills, James W.; and Shannon, James L., 4,074,385, Cl. 15-180.000.
Mills, King L.; and Johnson, Paul H., to Phillips Petroleum Company. Non-carcinogenic carbon black. 4,075,160, Cl. 260-42.470.
Milton, Thomas J., to General Motors Corporation. Lock cylinder assembly. 4,074,548, Cl. 70-1.500.
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Lafferty, Gary S., Sr., 4,075,523, Cl. 310-239.000.

Minegishi, Shuzo: *See*—
Sawachika, Yasumasa; Kawakami, Hiroshi; and Minegishi, Shuzo, 4,075,137, Cl. 260-2.5AT.
Miner Enterprises, Inc.: *See*—
Anderson, David G., 4,074,813, Cl. 213-24.000.
Minnesota Mining and Manufacturing Company: *See*—
Montean, Samuel, 4,075,618, Cl. 340-280.000.
Sterling, Craig A., 4,075,131, Cl. 252-542.000.
Wood, William A., 4,075,049, Cl. 156-220.000.
Minolta Camera Kabushiki Kaisha: *See*—
Ueda, Hiroshi; and Yoshizaki, Akira, 4,075,640, Cl. 354-31.000.
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Miskic, Franjo. Method of repairing or reinforcing tubular plastic members. 4,074,412, Cl. 29-401.00E.
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Doelp, Louis C.; Friedman, Lee; and Mitchell, Maurice M., 4,075,082, Cl. 208-10.000.
Mitchell, Robert Lee; and Chung, William John, to Colgate-Palmolive Company. Dental cream composition. 4,075,317, Cl. 424-52.000.
Mitsubishi Chemical Industries Limited: *See*—
Tanabe, Yasuo, 4,075,413, Cl. 560-244.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Nakamura, Hirokazu; and Motoyama, Hikoichi, 4,074,589, Cl. 74-604.000.
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Kurisu, Shingo; Oyamoto, Toshiya; Ochiai, Setumi; Miyamoto, Hiromu; and Makino, Katsuaki, 4,074,979, Cl. 48-111.000.
Nohara, Tomiyasu; Matsuno, Yoshiyuki; Harada, Hisamitsu; and Yamada, Akinori, 4,074,440, Cl. 34-92.000.
Mitsubishi Petrochemical Company Limited: *See*—
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Konno, Kazuhiko; Hayasi, Yosio; Taniyama, Eiji; and Sekiya, Tetsuo, 4,075,121, Cl. 252-407.000.
Takashi, Masanori; and Yoshiyasu, Mitsuo, 4,075,050, Cl. 156-229.000.
Mitsuhashi, Sadayuki; Suzuki, Norio; and Nago, Kazuyoshi, to Nippon Electric Co., Ltd. Signal switching device. 4,075,433, Cl. 179-18.0GE.
Mitsuhashi, Sadayuki: *See*—
Suzuki, Hideo; Ishiguro, Ginya; Mitsuhashi, Sadayuki; and Wakamatsu, Kazutoshi, 4,075,587, Cl. 335-112.000.
Mitsui Mining & Smelting Co., Ltd.: *See*—
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Mitsuno, Tatsuyuki: *See*—
Tabana, Minoru; Narisawa, Shizuo; Mitsuno, Tatsuyuki; and Maki, Hiroshi, 4,075,285, Cl. 260-876.00B.
Mitter, Mathias. Screen printing machine. 4,074,625, Cl. 101-128.100.
Miura, Kazumasa: *See*—
Sato, Hitoshi; Watanabe, Hazime; Miura, Kazumasa; and Kudo, Koji, 4,074,457, Cl. 43-113.000.
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Wilson, Charles A.; and Mixan, Craig E., 4,075,204, Cl. 260-250.0BC.
Wilson, Charles A.; and Mixan, Craig E., 4,075,205, Cl. 260-250.0BC.
Miyagawa Kasei Industry Co., Ltd.: *See*—
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Miyagawa, Shiro, to Miyagawa Kasei Industry Co., Ltd. Gas-discharging passage of storage battery and molding method thereof. 4,075,401, Cl. 429-89.000.
Miyamae, Toshiaki. Warning device. 4,075,629, Cl. 340-421.000.
Miyamoto, Hiromu: *See*—
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Mizoguchi, Yoshiyuki: *See*—
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Mizuno, Yukio; Kikuchi, Takeshi; and Kojima, Shuichi, to Nissan Motor Company, Limited Apparatus for selectively inserting weft yarns into the shed of a weaving loom. 4,074,728, Cl. 139-435.000.
Mizuno, Yukio, to Nissan Motor Company, Limited. Apparatus for selectively detaining and releasing weft yarns in weaving loom. 4,074,729, Cl. 139-450.000.
Mizuno, Yukio, to Nissan Motor Company, Limited. Weft-yarn drawing-off and length-measuring apparatus of weaving loom having weft selector means. 4,074,730, Cl. 139-452.000.
Mizunuma, Susumu: *See*—
Yanagimoto, Samon; Aoyagi, Koshiro; Mizunuma, Susumu; and Nambu, Kouki, 4,074,557, Cl. 72-206.000.
Mobil Oil Corporation: *See*—
Kerr, George T.; and Schweizer, Albert E., 4,075,307, Cl. 423-413.000.
Roberts, William Walter, 4,074,954, Cl. 418-68.000.
Mochizuki, Shigeaki: *See*—
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Modic, Fedor: *See*—
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Moens, Joris, to N. V. Bekaert S. A. Construction panels. 4,075,380, Cl. 428-140.000.
Moffett, Robert Bruce, to Upjohn Company, The. S-triazolo-1,5-benzodiazpine-4-ones. 4,075,202, Cl. 260-239.30T.
Mohammadioun, Said: *See*—
Bolick, Fred C., Jr.; Titus, Theodore, IV; and Mohammadioun, Said, 4,075,436, Cl. 179-100.1DR.
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Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Zimnukhov, Viktor Alexandrovich; Miroshnikova, Lidia Alexeevna; Kimel, Esfir Abramovna; Chefranova, Edit Konstantinovna; Guseva, Valentina Ivanovna; and Masagutova, Ljudmila Vladimirovna. Method of stabilization of rubbers and vulcanizates. 4,075,166, Cl. 260-45.95H.
Molenaar, Lester V. Apparatus for making a coil spring object. 4,074,958, Cl. 425-71.000.
Molex Incorporated: *See*—
Deshich, Dushan C.; Chmela, Frank P.; and Kufner, Kenneth L., 4,074,424, Cl. 29-753.000.
Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr., 4,075,052, Cl. 156-384.000.
Monk, James T.; Hailey, James L.; and Boyles, Tonnie M., to Taylor Machine Works, Inc. Bulk material reclaiming apparatus. 4,074,801, Cl. 198-304.000.
Monobond Australia Pty. Limited: *See*—
Aitchison, Lindsay Matthew; Sparks, Kenneth Arnold; and Schuster, Earl Eugene, 4,075,377, Cl. 428-95.000.
Monovis B. V.: *See*—
Clarke, Robert John; Hundy, Guy Francis; and Zimmern, Bernard, 4,074,957, Cl. 418-195.000.
Monroe Auto Equipment Company: *See*—
Paul, George A., 4,075,097, Cl. 210-168.000.
Paul, George A.; Hegel, Robert W.; Bethell, Michael R.; Branham, Charles L.; and Utter, Allan D., 4,075,098, Cl. 210-168.000.
Monsanto Company: *See*—
Anderson, Richard M.; Caviness, Alton L.; Menikheim, Virginia C.; and Silverman, Bernard, 4,075,383, Cl. 428-198.000.
Burke, William D.; Higginbottom, Harold P.; and Le Blanc, John R., 4,075,403, Cl. 429-253.000.
D'Amico, John J., 4,075,216, Cl. 260-294.80C.
Schuck, James M.; and Lewis, Charles, Jr., 4,075,197, Cl. 260-122.000.
Monsanto Research Corporation: *See*—
McClung, Charles E.; Schwendeman, James L.; and Salyer, Ival O., 4,075,265, Cl. 264-53.000.
Monsod, Godofredo G., Jr. Method for lining car, trucks and ship bodies, steel tubes, plates and other metallic bodies to protect same from abrasion, corrosion and heat. 4,075,373, Cl. 427-327.000.
Montean, Samuel, to Minnesota Mining and Manufacturing Company. Magnetic asymmetric antipilferage marker. 4,075,618, Cl. 340-280.000.
Moore, Charles R. Emergency lamp. 4,075,470, Cl. 362-287.000.
Moore, Clifton Ross; and Moore, John Greydon. Anti-skid tire chain. 4,074,741, Cl. 152-237.000.
Moore, Danny R.: *See*—
Chapman, Benjamin E.; Moore, Danny R.; and Phillips, Arthur F., 4,075,382, Cl. 428-192.000.
Moore, John Greydon: *See*—
Moore, Clifton Ross; and Moore, John Greydon, 4,074,741, Cl. 152-237.000.
Morehouse, Donald S., Jr.; Bolton, Frank H., deceased; and by Bolton, Kathryn M., administratrix, to Dow Chemical Company, The. Emulsion polymerization method for preparing microspheres having liquid center and seamless rigid walls. 4,075,134, Cl. 260-29.6RW.
Moreno, Pierre F.: *See*—
Richaud, Aime A.; Moreno, Pierre F.; and Rimbaud, Guy A., 4,074,585, Cl. 74-424.80R.
Morgan Construction Company: *See*—
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Morgan, Donald L.: *See*—
Dall, Arthur G.; and Morgan, Donald L., 4,074,594, Cl. 76-101.00A.
Morgan, Wesley W. Thermodynamic motor. 4,074,534, Cl. 60-675.000.
Morie, Gerald P.; and Sloan, Cephas H., to Eastman Kodak Company. Tobacco smoke filter rods having fibers bonded with water and glycol bonding dispersions. 4,074,724, Cl. 131-267.000.
Morimoto, Tatsuo; Nakamura, Munekazu; Inooka, Masayoshi; and Yawata, Teizaburo, to Chiyoda Chemical Engineering & Construction Co., Ltd. Catalysts for hydrodemetallization of hydrocarbons containing metallic compounds as impurities. 4,075,125, Cl. 252-455.00R.
Morrell, Roger J.; Gunn, Jerome A.; and Gore, Gerald D., to United States of America, Interior. Square hole drill. 4,074,778, Cl. 175-91.000.
Morris, Cyril R.: *See*—
Gower, Stephen G. M.; Morris, Cyril R.; and Wright, Ernest, 4,074,976, Cl. 23-292.000.

Morris, Donald E.: *See*—
Christopher, Chris J.; Wenninger, Fred W.; Morris, Donald E.; Covington, Wayne F.; Folsom, Jerry B.; Beyers, Joseph W.; Nairn, John H.; and Osborne, Jeffrey C., 4,075,679, Cl. 364-200.000.

Morris, Hugh C.: *See*—
Hoehn, Richard F.; Morris, Hugh C.; Therkildsen, Henry T.; and Behrends, Bertwin E., 4,074,796, Cl. 192-3.570.

Morrison, Charles F., Jr., to Valleylab, Inc. Improved electrosurgical instrument. 4,074,718, Cl. 128-303.140.

Morrison, Ward D., to Joy Manufacturing Company. Rock drill. 4,074,771, Cl. 173-6.000.

Morse, Norman Bernard; and Lester, David Bruce. Composition for non-squeal disc brake pads. 4,075,142, Cl. 260-17.00R.

Morton, Edgar J.; Donnan, Harold; and Wiesenfeld, Arnold, to Witco Chemical Corporation. Built detergent compositions. 4,075,117, Cl. 252-135.000.

Motoike, Yasuo: *See*—
Sasajima, Kikuo; Ono, Keiichi; Motoike, Yasuo; Inaba, Shigeho; and Yamamoto, Hisao, 4,075,346, Cl. 424-267.000.

Motorola, Inc.: *See*—
Davidson, Allen Loy; and Wanat, Ronald Joseph, 4,075,581, Cl. 333-10.000.
Dydyk, Michael, 4,075,578, Cl. 331-56.000.
Kennedy, Howard L.; and Ooms, John, 4,075,573, Cl. 330-129.000.
Millhollan, Michael Scott; and Reinschmidt, Robert Michael, 4,075,609, Cl. 365-154.000.
Scott, Paul Howard, 4,075,508, Cl. 307-213.000.

Motoyama, Hikoichi: *See*—
Nakamura, Hirokazu; and Motoyama, Hikoichi, 4,074,589, Cl. 74-604.000.

Mott, James D., to Hydril Company. Drilling tool. 4,074,761, Cl. 166-315.000.

Mowbray, Warwick; Hart, Richard; and Cavey, William, to Ciba-Geigy Corporation. Cattle dusting bag. 4,074,659, Cl. 119-159.000.

Moyer, Alan Ray, to Gillette Company, The. Compact hair curling iron. 4,075,458, Cl. 219-225.000.

Mrazek, Gustav: *See*—
Louzil, Friedrich; Habelt, Gerhard; and Mrazek, Gustav, 4,075,669, Cl. 360-92.000.

Mrcun, Ivan. Brushless alternator. 4,075,519, Cl. 310-67.00R.

Muehldorf, Eugen Igor: *See*—
Eichelberger, Edward Baxter; Muehldorf, Eugen Igor; Walther, Ronald Gene; and Williams, Thomas Walter, 4,074,851, Cl. 235-302.000.

Mueller, Richard A., to G. D. Searle & Co. Heterocyclic phosphonium salts. 4,075,407, Cl. 542-412.000.

Mukaemachi, Takuji; Takeshita, Tetsuo; Miyoshi, Tatsuru; and Kojima, Takafumi, to Hitachi, Ltd. Speech path system. 4,075,431, Cl. 179-18.0GF.

Mulcay, Michael: *See*—
Traficante, Daniel D.; and Mulcay, Michael, 4,075,552, Cl. 324-0.5AH.

Muller, Karl A., Jr., to Standard Oil Company (Indiana). Apparatus for distributing solid particles into a vertical vessel. 4,074,836, Cl. 222-564.000.

Multuloc Corporation: *See*—
Grearson, Kenneth R., 4,074,486, Cl. 52-235.000.

Munakata, Tsuneaki; and Kuboshima, Makoto, to Fuji Photo Film Co., Ltd. Folding camera. 4,075,645, Cl. 354-187.000.

Munehiro, Tomiji: *See*—
Shigeta, Junnosuke; and Munehiro, Tomiji, 4,074,605, Cl. 84-1.220.

Muntjanoff, John R., to Caterpillar Tractor Co. Variably biased control mechanism. 4,074,613, Cl. 91-413.000.

Murata, Moriyasu; Yamanaka, Makoto; and Fujino, Takashi, to Kao Soap Co., Ltd. Detergent composition. 4,075,129, Cl. 252-527.000.

Murdoch, Henry W., to Reed Tool Company. Drill bit. 4,074,922, Cl. 308-8.200.

Murman, Earll M.: *See*—
Cheung, John B.; and Murman, Earll M., 4,074,779, Cl. 175-314.000.

Muromura, Tadasumi, to Japan Atomic Energy Research Institute. Method for drying an ammonia gas stream. 4,075,306, Cl. 423-352.000.

Murphy, Howard C.: *See*—
Kraus, James R.; and Murphy, Howard C., 4,074,945, Cl. 403-197.000.

Murphy, Richard J., to Xerox Corporation. Fusing surface and method for fixing toner. 4,075,390, Cl. 428-307.000.

Myers, John D.; and Vollers, Charles S., to Kogre, Inc. Laser phosphate glass compositions. 4,075,120, Cl. 252-301.40P.

N L Industries, Inc.: *See*—
Stridde, George E., 4,075,126, Cl. 252-455.00R.

N. V. Bekaert S. A.: *See*—
Moens, Joris, 4,075,380, Cl. 428-140.000.

Naaijer, Geert Jan: *See*—
Borne, Jean Paul; and Naaijer, Geert Jan, 4,075,665, Cl. 360-8.000.

Nabisco, Inc.: *See*—
Thulin, Robert R., 4,075,359, Cl. 426-502.000.

Nagaisi, Hatuo: *See*—
Tokura, Naomi; Masaki, Kenji; and Nagaisi, Hatuo, 4,074,975, Cl. 23-288.00F.

Nagaoka, Isao: *See*—
Kawakami, Hiroshi; Tsukagawa, Yukio; and Nagaoka, Isao, 4,075,096, Cl. 210-96.00R.

Nagase, Mitsuo, to Yoshida Kogyo K. K. Decorative window sash frame assembly. 4,074,490, Cl. 52-312.000.

Nago, Kazuyoshi: *See*—
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Nairn, John H.: *See*—
Christopher, Chris J.; Wenninger, Fred W.; Morris, Donald E.; Covington, Wayne F.; Folsom, Jerry B.; Beyers, Joseph W.; Nairn, John H.; and Osborne, Jeffrey C., 4,075,679, Cl. 364-200.000.

Nakagawa, Yasuo: *See*—
Ozawa, Shuji; Nakagawa, Yasuo; Matsuda, Kichiro; Nishihara, Toshio; and Yunoki, Hideki, 4,075,172, Cl. 260-47.0CZ.

Nakamura, Hirokazu; and Motoyama, Hikoichi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Four cylinder in-line engine with driving balancer system. 4,074,589, Cl. 74-604.000.

Nakamura, Munekazu: *See*—
Morimoto, Tatsuo; Nakamura, Munekazu; Inooka, Masayoshi; and Yawata, Teizaburo, 4,075,125, Cl. 252-455.00R.

Nakata, Yohei. Timing apparatus. 4,075,506, Cl. 307-117.000.

Nalco Chemical Company: *See*—
Frisque, Alvin J.; and DuBrow, Paul L., 4,075,144, Cl. 260-22.00R.

Nambu, Kouki: *See*—
Yanagimoto, Samon; Aoyagi, Koshiro; Mizunuma, Susumu; and Nambu, Kouki, 4,074,557, Cl. 72-206.000.

Namoto, Yoshiteru; and Sakumoto, Hideki, to Matsushita Electric Industrial Co., Ltd. Tape auto-loading recording and reproducing apparatus. 4,075,670, Cl. 360-85.000.

Narbaits-Jaureguy, Jean-Raymond: *See*—
Bouverot, Rene; and Narbaits-Jaureguy, Jean-Raymond, 4,075,553, Cl. 324-233.000.

Narisawa, Shizuo: *See*—
Tabana, Minoru; Narisawa, Shizuo; Mitsuno, Tatsuyuki; and Maki, Hiroshi, 4,075,285, Cl. 260-876.00B.

Narita, Yoshiniro; Mochizuki, Shigeaki; Kakimoto, Shigeru; Komori, Norio; Watanabe, Kiyoshi; and Shiota, Hideji, to Idemitsu Kosan Co., Ltd. Method for producing polycarbonate powder from a polycarbonate solution. 4,074,864, Cl. 241-23.000.

National Patent Development Corporation: *See*—
Barer, Sol J.; and Stockel, Richard F., 4,075,007, Cl. 71-118.000.

National Research Development Corporation: *See*—
Bellhouse, Brian John, 4,075,091, Cl. 210-19.000.
McRae, Dougles Charles; and Hutchison, Philip Scott, 4,075,088, Cl. 209-106.000.

National Semiconductor Corporation: *See*—
Davies, David C., 4,075,702, Cl. 364-705.000.
Redfern, Thomas P., 4,075,509, Cl. 307-251.000.

National Steel Corporation: *See*—
Loest, Kent W.; and Schaefer, John T., 4,075,068, Cl. 204-93.000.

National Telephone Supply Company, The: *See*—
Neale, Dory J., Sr., 4,075,417, Cl. 174-84.00C.

Naylor, Carter G.; and Yeakey, Ernest L., to Texaco Development Corporation. Polyoxypropylene polyamine derivatives as defoamers. 4,075,130, Cl. 252-548.000.

NCR Corporation: *See*—
Gulett, Michael R., 4,075,367, Cl. 427-94.000.
Lewis, Kim R.; and Corbett, William H., 4,074,797, Cl. 197-1.00R.
Wescott, Robert D.; and Christie, John B., 4,074,852, Cl. 235-463.000.

Neal, William R.; and Little, Roger G., to Simulation Physics. Method and apparatus involving the generation of X-rays. 4,075,489, Cl. 250-401.000.

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Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid, Handel en Verkeer: *See*—
Ritter, Fridolin Jacob; and Stein, Friedrich, 4,075,320, Cl. 424-84.000.

Neff, Marion W.: *See*—
Hilley, Larry L.; and Neff, Marion W., 4,075,605, Cl. 340-146.3AC.

Negre, Robert Paul, to Pont-A-Mousson S.A. Centrifugal casting machine having a device for axially placing and maintaining a core in position. 4,074,748, Cl. 164-292.000.

Neiman S. A.: *See*—
Lipschutz, Paul, 4,074,551, Cl. 70-364.00R.

Nelson, John E., to Hamilton Technology, Inc. Intermaxillary tooth moving device. 4,074,433, Cl. 32-14.00E.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-3,7-inter-m-phenylene-3-oxa-11-deoxy-PGE_1 compounds. 4,075,247, Cl. 260-590.00C.

Nelson, Paul T., to TRW Inc. Controlled thermal expansivity structure. 4,074,473, Cl. 52-1.000.

Nemoto, Mitsuo; and Honma, Kimiyasu, to Kabushiki Kaisha Audio-Technica. Stereophonic pickup cartridge. 4,075,418, Cl. 179-100.41K.

Neville, Martin Charles: *See*—
Verge, John Pomfret; Neville, Martin Charles; and Friedman, Henry, 4,075,222, Cl. 548-336.000.

New Archery Products Corporation: *See*—
Simo, Miroslav Andrew, 4,074,674, Cl. 124-41.00A.

Newman, Gerald H.: *See*—
Francis, Robert W.; and Newman, Gerald H., 4,075,397, Cl. 429-50.000.

NGK Spark Plug Co. Ltd.: *See*—
Yagi, Hideaki; and Hishiki, Tetsuo, 4,075,449, Cl. 200-315.000.

Nickell, Joe H. Survival kit container. 4,075,078, Cl. 206-546.000.

Nickerson, William A.: *See*—
Keller, James R.; and Nickerson, William A., 4,074,498, Cl. 52-690.000.

Nicolaides, Ernest D., to Parke, Davis & Company. Nonapeptides and methods for their production. 4,075,192, Cl. 260-112.5LH.

Nielsen, Milton R.; and Olsen, Robert A., to American Hospital Supply Corporation. Pressure-responsive speed control for dental handpieces. 4,074,434, Cl. 32-27.000.

Niemela, W. Wally. Hinged snowplow, conversion kit, and method therefor. 4,074,448, Cl. 37-41.000.

Niemeyer, Heinrich, to Westfalia Separator AG. Apparatus for the continuous production of standardized milk. 4,074,622, Cl. 99-456.000.

Niggeloh, Fritz. Photographic implement. 4,075,642, Cl. 354-82.000.

Nippon Carbon Co., Ltd.: *See*—
Ishikawa, Toshikatsu; Junichi, Tanaka; Teranishi, Haruo; and Kondo, Shinichiro, 4,075,114, Cl. 252-62.000.

Nippon Columbia Kabushikikaisha: *See*—
Hayashi, Hideaki; and Kakuta, Susumu, 4,074,873, Cl. 242-75.430.
Kamo, Yoshihisa; Tachibana, Takeshi; and Ichimura, Masao, 4,075,425, Cl. 179-1.0GQ.

Nippon Electric Co., Ltd.: *See*—
Iijima, Yukihiko; Iinuma, Kazumoto; and Ishiguro, Tatsuo, 4,075,655, Cl. 358-13.000.
Mitsuhashi, Sadayuki; Suzuki, Norio; and Nago, Kazuyoshi, 4,075,433, Cl. 179-18.0GE.
Suzuki, Hideo; Ishiguro, Ginya; Mitsuhashi, Sadayuki; and Wakamatsu, Kazutoshi, 4,075,587, Cl. 335-112.000.

Nippon Soda Company, Limited: *See*—
Sawaki, Mikio; Iwataki, Isao; Hirono, Yoshihiko; and Ishikawa, Hisao, 4,075,239, Cl. 260-464.000.

Nippon Soken, Inc.: *See*—
Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, 4,074,661, Cl. 123-3.000.
Obayashi, Hideki; Kohama, Tokio; Hattori, Tadashi; and Nishida, Minoru, 4,074,566, Cl. 73-116.000.

Nippon Steel Corporation: *See*—
Taketani, Osamu, 4,074,402, Cl. 24-268.000.
Ueno, Masakatsu; Kato, Osamu; Kawauchi, Nobuyuki; and Itoh, Kametaro, 4,075,041, Cl. 148-12.400.
Yanagimoto, Samon; Aoyagi, Koshiro; Mizunuma, Susumu; and Nambu, Kouki, 4,074,557, Cl. 72-206.000.

Nippon Telegraph and Telephone Public Corporation: *See*—
Suzuki, Hideo; Ishiguro, Ginya; Mitsuhashi, Sadayuki; and Wakamatsu, Kazutoshi, 4,075,587, Cl. 335-112.000.

Nippon Zeon Co. Ltd.: *See*—
Akiyama, Shinichi; and Yamamoto, Haruhisa, 4,075,244, Cl. 260-530.00N.

Nippondenso Co., Ltd.: *See*—
Kondo, Yoshihiko, 4,075,501, Cl. 307-41.000.

Nishida, Minoru: *See*—
Obayashi, Hideki; Kohama, Tokio; Hattori, Tadashi; and Nishida, Minoru, 4,074,566, Cl. 73-116.000.

Nishida, Yoshio: *See*—
Noguchi, Yukihide; Nishimura, Takeshi; Kishimoto, Jotaro; and Nishida, Yoshio, 4,074,654, Cl. 118-73.000.

Nishihara, Toshio: *See*—
Ozawa, Shuji; Nakagawa, Yasuo; Matsuda, Kichiro; Nishihara, Toshio; and Yunoki, Hideki, 4,075,172, Cl. 260-47.0CZ.

Nishimura, Kazuhiro; Harada, Jumei; Migita, Tetsuhiko; and Matsunaga, Tsutomu, to Bridgestone Tire Company Limited. Methods of casting pneumatic tires. 4,075,275, Cl. 264-313.000.

Nishimura, Sadaji: *See*—
Takasuka, Kaoru; Takahashi, Masatatsu; and Nishimura, Sadaji, 4,075,498, Cl. 250-562.000.

Nishimura, Takeshi: *See*—
Noguchi, Yukihide; Nishimura, Takeshi; Kishimoto, Jotaro; and Nishida, Yoshio, 4,074,654, Cl. 118-73.000.

Nissan Denshi Kabushikikaisha: *See*—
Kazuo, Arai, 4,075,565, Cl. 325-138.000.

Nissan Motor Company, Limited: *See*—
Mizuno, Yukio; Kikuchi, Takeshi; and Kojima, Shuichi, 4,074,728, Cl. 139-435.000.
Mizuno, Yukio, 4,074,729, Cl. 139-450.000.
Mizuno, Yukio, 4,074,730, Cl. 139-452.000.
Tokura, Naomi; Masaki, Kenji; and Nagaisi, Hatuo, 4,074,975, Cl. 23-288.00F.

Nissen, Stanley M.; and Wallach, Steven J., to Raytheon Company. Microprogram controlled digital computer. 4,075,687, Cl. 364-200.000.

Nitta, Kazuo: *See*—
Kojima, Masaharu; Ogawa, Hiroshi; Maeda, Minoru; Nitta, Kazuo; and Ito, Takayuki, 4,075,334, Cl. 424-238.000.

Noe, Oskar, to BWG Bergwerk-und Walzwerk Maschinenbau Gesellschaft mit beschrankter Haftung. Method of and apparatus for improving hot-rolled sheet-metal strips. 4,074,555, Cl. 72-128.000.

Noguchi, Masaaki; Bunda, Tauchio; and Tanaka, Taro, to Nippon Soken, Inc. Fuel reforming system for an internal combustion engine. 4,074,661, Cl. 123-3.000.

Noguchi, Yukihide; Nishimura, Takeshi; Kishimoto, Jotaro; and Nishida, Yoshio, to Takeda Chemical Industries, Ltd. Automatic closure cleansing and coating machine. 4,074,654, Cl. 118-73.000.

Nohara, Tomiyasu; Matsuno, Yoshiyuki; Harada, Hisamitsu; and Yamada, Akinori, to Mitsubishi Jukogyo Kabushiki Kaisha; and Kabushiki Kaisha Kobe Seikosho. Automatic vacuum dehydrating apparatus in a slurry carrying vessel. 4,074,440, Cl. 34-92.000.

Nolan, Harold L. Method of making dual wall pipe with foam insulation between pipe walls. 4,075,268, Cl. 264-138.000.

Nolin, Joseph Arthur Benoit: *See*—
Anton, Anthony; and Nolin, Joseph Arthur Benoit, 4,075,378, Cl. 428-97.000.

Nonnemacher, Gerhard; Knodel, Emil; Robeller, Walter; and Bosch, Paul, to Robert Bosch GmbH. Pumping arrangement control device. 4,074,955, Cl. 417-218.000.

Nordebo, Knut Assar. Multi-phase generator without slip rings and brushes. 4,075,521, Cl. 310-184.000.

Nordhofen, Benedikt, to Bayer Aktiengesellschaft. Method and apparatus for the measurement of volumetric flowrate in pipes and ducts. 4,074,573, Cl. 73-205.00R.

Norris, Alan H.: *See*—
Chambley, Phillip W.; and Norris, Alan H., 4,074,511, Cl. 57-34.0AT.

North American Products Corporation: *See*—
Dall, Arthur G.; and Morgan, Donald L., 4,074,594, Cl. 76-101.00A.

North, Howard L., Jr., to Becton, Dickinson and Company. Method and apparatus for measuring fluid specific gravity. 4,074,562, Cl. 73-32.00A.

Northern Telecom Limited: *See*—
Straus, Jozef; and Szentesi, Otto Istvan, 4,075,474, Cl. 250-199.000.

Noshiro, Atsumi: *See*—
Takamizawa, Minoru; Yamamoto, Yasushi; Inoue, Yoshio; Noshiro, Atsumi; and Fujii, Hitoshi, 4,075,167, Cl. 260-46.50E.

Nossler, Franz: *See*—
Grill, Michael; Grohmann, Helmut; and Nossler, Franz, 4,075,293, Cl. 261-20.000.

Nouvertne, Werner: *See*—
Schmidt, Manfred; Freitag, Dieter; and Nouvertne, Werner, 4,075,119, Cl. 252-182.000.

Novotny, Rudolph J., to United Technologies Corporation. High pressure lightweight flanges. 4,074,914, Cl. 285-405.000.

Noyes, Richard Croissant, to Combustion Engineering, Inc. Articulated fuel assembly. 4,075,058, Cl. 176-21.000.

Noyes, Robert: *See*—
Brady, John K.; and Noyes, Robert, 4,075,302, Cl. 269-43.000.

Nuchman, Benjamin; and Whang, Sang Y. Apparatus for manufacturing lenses. 4,074,469, Cl. 51-217.00L.

Nuss, James W., to Ferro Corporation. Inorganic pigment comprising a solid solution of differing spinels. 4,075,029, Cl. 106-288.00B.

Nussbaum, Hans. Traveling nut assembly with low friction and automatic brake. 4,074,586, Cl. 74-424.80C.

N.V. Western Gear Europe S.A.: *See*—
Harig, Manfred, 4,074,582, Cl. 74-230.240.

O & R Inktchemie N.V.: *See*—
Schelhaas, Ealbertus Willem; and Blokker, Eduard Johannes Cornelis Marie, 4,075,143, Cl. 260-17.200.

Obara, Masaaki: *See*—
Koyama, Tsuneo; Sugiyama, Yuichi; Furuhama, Teruhide; Tajima, Yoshio; Kakiuchi, Hiroshi; Yamada, Kazuhiro; and Obara, Masaaki, 4,075,159, Cl. 260-42.470.

Obayashi, Hideki; Kohama, Tokio; Hattori, Tadashi; and Nishida, Minoru, to Nippon Soken, Inc. Intake air amount detecting device for an internal combustion engine. 4,074,566, Cl. 73-116.000.

Obenhaus, Robert E.: *See*—
Squiers, David J.; and Obenhaus, Robert E., 4,075,674, Cl. 361-27.000.

Oberg, Elmer B., to Paul Taylor Co. Process for preparing stable full fat oilseed extract. 4,075,361, Cl. 426-655.000.

Oberman, Joel Roy; and Stewart, Roger Green, to RCA Corporation. Write enhancement circuit. 4,075,690, Cl. 365-156.000.

Ochiai, Setumi: *See*—
Kurisu, Shingo; Oyamoto, Toshiya; Ochiai, Setumi; Miyamoto, Hiromu; and Makino, Katsuaki, 4,074,979, Cl. 48-111.000.

Ochiai, Tomoyoshi; Hayashi, Takeshi; and Furuse, Mituhiro, to Tokyo Denryoku Kabushiki Kaisha; and Kabushiki Kaisha Meidensha. Apparatus for monitoring two electric quantities by combining three consecutive samples of each quantity. 4,075,697, Cl. 364-481.000.

O'Donnell, Brian: *See*—
Capriotti, Alfred J.; Lazzaretti, Louis G.; and O'Donnell, Brian, 4,074,439, Cl. 33-286.000.

Oehrli, Beat; Mettler, Max; and Righetti, Bruno, to Lonza, Ltd. Process for stabilizing metaldehyde and stabilized composition. 4,075,229, Cl. 260-340.000.

Oesterle, Helmut, to Hilti Aktiengesellschaft. Fastening element feeding device for an explosive powder driven setting gun. 4,074,843, Cl. 227-8.000.

Ogawa, Hiroshi: *See*—
Kojima, Masaharu; Ogawa, Hiroshi; Maeda, Minoru; Nitta, Kazuo; and Ito, Takayuki, 4,075,334, Cl. 424-238.000.

Ogden Metals, Inc.: *See*—
Burlingame, Richard D.; and Markels, Michael, Jr., 4,075,370, Cl. 427-216.000.

Ohnishi, Masanori, to Matsushita Electric Industrial Co., Ltd. Hybrid framework consisting of metallic plate and projections made of synthetic resin. 4,075,395, Cl. 428-542.000.

Ohtani, Toshiyuki: *See*—
Sakamaki, Hisashi; and Ohtani, Toshiyuki, 4,075,456, Cl. 219-216.000.

Oikawa, Yoshifumi: *See*—
Shibata, Takehiko; Ando, Tadahiko; Kitsunai, Tokuji; Kamiyama, Norio; and Oikawa, Yoshifumi, 4,075,062, Cl. 195-103.50R.

Oil Recovery Corporation: *See—*
Scott, Harold W., 4,074,758, Cl. 166-249.000.
Okada, Toshio: *See—*
Sakurada, Ichiro; Okada, Toshio; and Hirano, Yutaka, 4,075,075, Cl. 204-159.170.
Okamoto, Shinobu. Apparatus for holding battery. 4,075,402, Cl. 429-98.000.
Okamura, Kenji: *See—*
Saito, Masaaki; and Okamura, Kenji, 4,075,294, Cl. 261-34.00A.
Okayama, Shigeo; and Kawakatsu, Hisazo, to Agency of Industrial Science & Technology. Pattern forming apparatus using quadrupole lenses. 4,075,488, Cl. 250-396.00R.
Okudaira, Sadao, to Asahi Kogaku Kogyo Kabushiki Kaisha. Variable focal length lens system. 4,074,931, Cl. 350-184.000.
Olander, Walter Karl, to General Electric Company. Promotion of manganese chelate catalyzed polyphenylene ether oxide polymerization reactions. 4,075,174, Cl. 260-47.0ET.
Olcott, Tyler Keith, to W. R. Grace & Co. Method for making blow molded generally tire shaped articles. 4,075,187, Cl. 264-89.000.
O'Leary, George P., to Floating Point Systems, Inc. Floating point data processor for high speech operation. 4,075,704, Cl. 364-748.000.
Olin Corporation: *See—*
Boudakian, Max M., 4,075,252, Cl. 260-649.00F.
Hodil, Elmer Raleigh, Jr., 4,074,844, Cl. 227-8.000.
Ollivier, Jean; and Combette, Marc. Device for inserting nail-like fasteners at difficultly accessible points. 4,074,842, Cl. 227-8.000.
Ollivier, Jean: *See—*
Combette, Marc; and Ollivier, Jean, 4,074,845, Cl. 227-10.000.
Olsen, Robert A.: *See—*
Nielsen, Milton R.; and Olsen, Robert A., 4,074,434, Cl. 32-27.000.
Olstowski, Franciszek, to Dow Chemical Company, The. Solid, rapid-setting, rigid polyurethanes. 4,075,151, Cl. 260-33.20R.
Oman, Richard A.; and Foreman, Kenneth M., to Grumman Aerospace Corporation. Variable stator, diffuser augmented wind turbine electrical generation system. 4,075,500, Cl. 290-55.000.
Omodei-Sale, Amedeo; Consonni, Pietro; and Lerner, Leonard, to Gruppo Lepetit S.p.A. 2-Substituted phenyl-5-triazols [5,1-a] isoquinoline compounds. 4,075,341, Cl. 424-258.000.
Onishi, Toshimi: *See—*
Takeda, Kouichi; Sato, Hiroshi; and Onishi, Toshimi, 4,074,556, Cl. 72-196.000.
Ono, Keiichi: *See—*
Sasajima, Kikuo; Ono, Keiichi; Motoike, Yasuo; Inaba, Shigeho; and Yamamoto, Hisao, 4,075,346, Cl. 424-267.000.
Ono, Taisaburo. Underwater trusses for breakwater structure. 4,074,497, Cl. 52-648.000.
Ooms, John: *See—*
Kennedy, Howard L.; and Ooms, John, 4,075,573, Cl. 330-129.000.
Ordorika, Imanol. Tubular dwelling construction. 4,074,476, Cl. 52-79.200.
Oroshnik, William: *See—*
Close, Ralph E.; and Oroshnik, William, 4,075,257, Cl. 260-680.00R.
Orr, Brian William Gordon: *See—*
Watt, Robert Duncan; and Orr, Brian William Gordon, 4,074,503, Cl. 52-749.000.
Orsing, John Harry. Disposable saliva ejector. 4,074,435, Cl. 32-33.000.
Orsini, Ronald J.; and Universita, Joseph Della. Idle speed needle screw for carburetors. 4,075,296, Cl. 261-41.00D.
Orthman, Henry K., to Orthman Manufacturing Inc. Floating folding tool bar having a lock means. 4,074,766, Cl. 172-311.000.
Orthman Manufacturing Inc.: *See—*
Orthman, Henry K., 4,074,766, Cl. 172-311.000.
Ortho Pharmaceutical Corporation: *See—*
Hirsch, Allen Frederick, 4,075,351, Cl. 424-303.000.
Ortinau, Jerry T.: *See—*
Madl, Ronald L.; Simon, Frank J.; and Ortinau, Jerry T., 4,075,358, Cl. 426-465.000.
Osborne, Jeffrey C.: *See—*
Christopher, Chris J.; Wenninger, Fred W.; Morris, Donald E.; Covington, Wayne F.; Folsom, Jerry B.; Beyers, Joseph W.; Nairn, John H.; and Osborne, Jeffrey C., 4,075,679, Cl. 364-200.000.
Ostermayer, Franz: *See—*
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Wilhelm, Max; Eichenberger, Kurt; Schroter, Herbert; and Ostermayer, Franz, 4,075,335, Cl. 424-244.000.
Oswald, Alexis A.; and Valint, Paul L., Jr., to Exxon Research & Engineering Co. Pesticidal O,S'-dialkyl S-hydrocarbylthioalkyl dithiophosphates and oxidized derivatives thereof. 4,075,332, Cl. 424-216.000.
Oswald, Hendrikus Johan: *See—*
Li, Hsin Lang; Oswald, Hendrikus Johan; and Liland, Alfred Louis, 4,074,405, Cl. 28-257.000.
Oswald, Leo Alex, to Owens-Corning Fiberglas Corporation. Method and apparatus for depositing material into a moving receptacle. 4,075,301, Cl. 264-40.700.
Otani, Akira, to Tanabe Kokoki Co., Ltd. Casting machine with mold tilting discharge means. 4,074,749, Cl. 164-326.000.
Otsu, Iwao; and Watanabe, Motohisa. Process for the marking on metal or the like surfaces. 4,075,064, Cl. 204-18.00R.
Otsuka, Yoshinao: *See—*
Takahashi, Hirohiko; Otsuka, Yoshinao; Sato, Yuichiro; and Tsukamoto, Yoshiki, 4,074,747, Cl. 164-443.000.
Otto, Joseph H., Sr. Dispensing container. 4,074,833, Cl. 222-390.000.
Otto, Lonnie E., Jr.: *See—*
Arndt, Kenneth E.; Otto, Lonnie E., Jr.; and Siekmeier, David A., 4,074,783, Cl. 180-14.00R.
Outboard Marine Corporation: *See—*
Cavil, David T.; Hansen, Einar T.; and Schmidt, Henry J., 4,074,669, Cl. 123-148.0CC.
Patis, Bruce L., 4,074,665, Cl. 123-102.000.
Outlaw, Benjamin T.: *See—*
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Leinonen, Erkki Ilmari, 4,075,548, Cl. 323-86.000.
Saari, Kaarlo Matti Juhani; and Kalliokoski, Aarno Iisakki, 4,075,089, Cl. 209-169.000.
Sipila, Heikki Johannes; and Kiuru, Erkki Sakari, 4,075,486, Cl. 250-374.000.
Outram, Christopher David, to CCL Systems Limited. Connecting reinforcing bars in an access hole. 4,074,493, Cl. 52-583.000.
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Lupton, Daniel C.; Vermilion, Donn R.; and Bucher, James L., 4,075,048, Cl. 156-136.000.
Oswald, Leo Alex, 4,075,301, Cl. 264-40.700.
Philipps, Thomas E., 4,075,155, Cl. 260-38.000.
Stotler, David V., 4,074,871, Cl. 242-42.000.
Owens-Illinois, Inc.: *See—*
Marsh, Samuel W., III; and Zumwalt, Keith E., Sr., 4,075,086, Cl. 209-73.000.
Oxenrider, Bryce C.: *See—*
Woolf, Cyril, deceased; Mares, Frank; and Oxenrider, Bryce C., 4,075,410, Cl. 560-87.000.
Oyamoto, Toshiya: *See—*
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Ozalid Group Holdings Limited: *See—*
Gilbert, Joseph; McRobbie, Malcolm McKenzie; and Gee, Wilfred, 4,075,637, Cl. 346-153.000.
Ozawa, Shuji; Nakagawa, Yasuo; Matsuda, Kichiro; Nishihara, Toshio; and Yunoki, Hideki, to Teijin Limited. Novel aromatic copolyamides prepared from 3,4' diphenylene type diamines, and shaped articles therefrom. 4,075,172, Cl. 260-47.0CZ.
P. R. Mallory & Co. Inc.: *See—*
Pearce, Godfrey R.; Breeden, William J.; and See, Francis R., 4,074,417, Cl. 29-570.000.
Packer, Eugene S.; and England, George J., to DeSoto, Inc. Low gloss radiation cure. 4,075,366, Cl. 427-44.000.
Paget, Charles J., to Eli Lilly and Company. S-triazolo[5,1-b]benzothiazoles. 4,075,218, Cl. 260-305.000.
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Johansson, Ake Ernst Elof; and Pahlen, Lars Christer, 4,075,683, Cl. 361-415.000.
Palenscar, William J. Pipe. 4,074,723, Cl. 131-198.00R.
Palkiewicz, John Louis: *See—*
Tsen, Lo Kwang; and Palkiewicz, John Louis, 4,075,260, Cl. 260-830.0TW.
Palme, Anthony Ferdinand; and Streeter, Daniel Inott, to Smyth Manufacturing Company, The. Heating apparatus for book forming and creasing irons. 4,074,382, Cl. 11-1.0CP.
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Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcz, 4,075,249, Cl. 260-613.00D.
Paltier Corporation, The: *See—*
Skubic, Leroy F.; Donkle, Lucius B., Jr.; and Groth, Donald L., 4,074,812, Cl. 211-192.000.
Panetti, Romolo. Apparatus for the continuous on-track truing of railway rails. 4,074,468, Cl. 51-178.000.
Pangborn, Jon B.; Sharer, John C.; and Elkins, Robert H., to American Gas Association. Process for producing hydrogen and oxygen from water. 4,075,313, Cl. 423-658.000.
Panzer, Jerome, to Exxon Research & Engineering Co. Combination of asphaltenes with flow improver polymers to improve the flow properties of high boiling fuel oils. 4,074,978, Cl. 44-62.000.
Panzera, Carlino, to Brunswick Corporation. Porous ceramic seals and method of making same. 4,075,364, Cl. 427-34.000.
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Maffrand, Jean-Pierre, 4,075,340, Cl. 424-256.000.
Pariza, George R., to Pittway Corporation. Electric horn. 4,075,627, Cl. 340-388.000.
Parke, Davis & Company: *See—*
Butler, Donald E., 4,075,408, Cl. 548-324.000.
Campbell, Cyrill John; and Liu, Daniel Ting Hsiu, 4,075,193, Cl. 260-112.00B.
Nicolaides, Ernest D., 4,075,192, Cl. 260-112.5LH.
Tinney, Francis John, 4,075,189, Cl. 260-112.50R.
Parker, David H. Recovery buoy. 4,074,380, Cl. 9-8.00R.
Parker, Roger John: *See—*
Drewe, Nigel Wyndham; Parker, Roger John; and Tadros, Tharwat Fouad, 4,075,002, Cl. 71-92.000.
Parker, William H.; and Hart, Lawrence, to Del Norte Technology, Inc. Wireline running tool. 4,074,762, Cl. 166-315.000.
Parnaby, Derek. Treatment of effluent. 4,075,095, Cl. 210-82.000.
Pascente, Joseph E. Thyristor voltage switching circuits. 4,075,510, Cl. 307-252.00B.
Pasko, John G.: *See—*
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Passavant, Francis C.; and Pease, Richard R., to GTE Sylvania Incorporated. Video display system. 4,075,620, Cl. 340-324.0AD.

Patel, Bhupendra C.: *See—*
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Patel, Mahesh S., to Eutectic Corporation. Wear resistant alloy coating containing tungsten carbide. 4,075,371, Cl. 427-224.000.

Patellis, Anargiros Pete: *See—*
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Patent Development & Management Company: *See—*
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Pater, Walter E.; and Rowley, James R., to PPG Industries, Inc. Front restraint device for shipping bins. 4,074,823, Cl. 214-152.000.

Patis, Bruce L., to Outboard Marine Corporation. Engine speed limiter. 4,074,665, Cl. 123-102.000.

Pato, Tibor, to Gebruder Ott A.G. Method and apparatus for regulating the fat content of milk. 4,075,355, Cl. 426-231.000.

Patton, Ann T.; Roscetti, Betty Ann; and Held, Lisa. Water scooter. 4,074,381, Cl. 9-310.00J.

Paul, George A., to Monroe Auto Equipment Company. Oil filter with oil improving dissolving body. 4,075,097, Cl. 210-168.000.

Paul, George A.; Hegel, Robert W.; Bethell, Michael R.; Branham, Charles L.; and Utter, Allan D., to Monroe Auto Equipment Company. Masking elements for dissolving oil improving body in an oil filter. 4,075,098, Cl. 210-168.000.

Paul, Maynard Carlton: *See—*
Johnson, Leslie Harold; Lo, David Shih-Fang; and Paul, Maynard Carlton, 4,075,612, Cl. 365-171.000.

Paul Taylor Co.: *See—*
Oberg, Elmer B., 4,075,361, Cl. 426-655.000.

Pauli, Gunter; and Jahn, Gerhard, to G.A.O. Gesellschaft fur Automation und Organisation mbH. Circuit arrangement for evaluating signals, particularly output signals of optical measuring devices. 4,075,507, Cl. 307-117.000.

Pauluis, Gerard J. C. A., to Atomic Energy of Canada Limited. Dual temperature isotope exchange apparatus using hot feed with liquid recycle from the humidifier. 4,074,974, Cl. 23-270.00R.

Paulus, Wilfried; and Rullmann, Karl-Heinz, to Bayer Aktiengesellschaft. Process for preparing solutions of N-methylol-chloroacetamide. 4,075,245, Cl. 260-561.0HL.

Pawlowicz, Manfred: *See—*
Koch, Heinz; Pawlowicz, Manfred; and Brams, Bernhard, 4,074,982, Cl. 51-92.00R.

Payette, Lionel Joseph: *See—*
Karkoski, Joseph; McGregor, Charles William; and Payette, Lionel Joseph, 4,075,179, Cl. 260-75.00N.

Pearce, Godfrey R.; Breeden, William J.; and See, Francis R., to P. R. Mallory & Co. Inc. Method of sealing electrical housing. 4,074,417, Cl. 29-570.000.

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Pearsall, Harold I., to Globe Tool and Engineering Company, The. Stator coil winding and lead wire connection. 4,074,418, Cl. 29-596.000.

Peart, Leslie Thomas, to Beckman Instruments, Inc. Variable resistor with dual ratio input shaft. 4,075,597, Cl. 338-128.000.

Pease, Richard R.: *See—*
Passavant, Francis C.; and Pease, Richard R., 4,075,620, Cl. 340-324.0AD.

Peel, Harry H.: *See—*
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Pegis, Richard J.: *See—*
Levy, Chauncey F., Jr.; and Pegis, Richard J., 4,074,368, Cl. 3-13.000.

Pelton, Peter G.; Grubman, Alan A.; and Hasegawa, Gary, to Continental Group, Inc., The. Integral oil supply and filter. 4,075,099, Cl. 210-168.000.

Pember, Carleton R. Bird frightener. 4,074,653, Cl. 116-22.00A.

Pennila, Simo A. O. Thin and low specific heat ceramic coating and method for increasing operating efficiency of internal combustion engines. 4,074,671, Cl. 123-191.00A.

Pennsylvania Wire Rope Corporation: *See—*
Kraus, James R.; and Murphy, Howard C., 4,074,945, Cl. 403-197.000.

Pennwalt Corporation: *See—*
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MacLeay, Ronald Edward; Sheppard, Chester Stephen; and Lange, Harold Carl, 4,075,199, Cl. 260-192.000.
MacLeay, Ronald Edward; and Sheppard, Chester Stephen, 4,075,286, Cl. 260-877.000.
Wagle, Uday Dakornath; and Ramdas, Venkatram, 4,075,236, Cl. 260-453.0RZ.

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Perelman, Arthur, to Imperial Chemical Industries Limited. Melt-spinning grid. 4,074,707, Cl. 126-343.50A.

Perilhou, Jean Robert, to U.S. Philips Corporation. Gamma-radiation tomography system. 4,075,482, Cl. 250-363.00S.

Personal Information Indexing Reader: *See—*
Yevick, George J., 4,074,933, Cl. 353-27.00R.

Peter, Emil. Method for manufacturing a support framework. 4,074,502, Cl. 52-741.000.

Peterson, Dean M., to Honeywell Inc. Dual scanning focusing system. 4,075,639, Cl. 354-25.000.

Peterson, Donald John, to Procter & Gamble Company, The. Hydrated soap making. 4,075,234, Cl. 260-417.000.

Peterson, John G. Illuminated drafting instrument. 4,075,467, Cl. 362-31.000.

Petke, Frederick David: *See—*
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Petro-Tex Chemical Corporation: *See—*
Foster, Alan W.; and Besozzi, Alfio J., 4,075,256, Cl. 260-680.00E.

Petrolite Corporation: *See—*
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Redmore, Derek; Outlaw, Benjamin T.; and Martin, Richard L., 4,075,291, Cl. 260-933.000.

Pfizer Inc.: *See—*
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Phalen, Frank William: *See—*
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Phillips, Arthur F.: *See—*
Chapman, Benjamin E.; Moore, Danny R.; and Phillips, Arthur F., 4,075,382, Cl. 428-192.000.

Phillips, Charles M., Jr. Interrupter. 4,075,676, Cl. 361-56.000.

Phillips Petroleum Company: *See—*
Coale, Harold D., 4,075,158, Cl. 260-42.170.
Doss, Richard C., 4,075,388, Cl. 428-297.000.
Hunt, Harold R., 4,075,140, Cl. 260-5.000.
Johnson, Paul H., 4,075,156, Cl. 260-42.470.
Johnson, Paul H., 4,075,157, Cl. 260-42.470.
Mills, King L.; and Johnson, Paul H., 4,075,160, Cl. 260-42.470.
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Stapp, Paul R., 4,075,412, Cl. 560-244.000.

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Pierce, Sherman L.; and Pierce, Harold D. Carburetion system for an internal combustion engine. 4,074,666, Cl. 123-134.000.

Pillon, Daniel: *See—*
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Pim, Norman L., to Gulf & Western Manufacturing Company. Roll changing apparatus. 4,074,558, Cl. 72-239.000.

Pimbley, Walter Thornton: *See—*
Galetto, Louis Valentine; Meier, Johann Hans; Pimbley, Walter Thornton; and Wolfe, Bruce Allen, 4,075,636, Cl. 346-75.000.

Piper, William W.; Prener, Jerome S.; and Gillooly, George R., to General Electric Company. Cool-white fluorescent lamp with phosphor having modified spectral energy distribution to improve luminosity thereof. 4,075,532, Cl. 313-497.000.

Pitel, Ira J., to GTE Sylvania Incorporated. Sinusoidal wave oscillator ballast circuit. 4,075,476, Cl. 315-209.00R.

Pitney-Bowes, Inc.: *See—*
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Pittsburgh Corning Corporation: *See—*
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Pittway Corporation: *See—*
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Plasko, Emil Robert, to Emerson Electric Co. Temperature responsive electrical switch construction and method of making the same. 4,075,595, Cl. 337-407.000.

Plasko, Emil Robert, to Emerson Electric Co. Sealed casing for a thermally actuable electrical switch. 4,075,596, Cl. 337-408.000.

Plewes, John Travis: *See—*
Chin, Gilbert Yukyu; Plewes, John Travis; and Wonsiewicz, Bud Caesar, 4,075,437, Cl. 179-114.00R.

Plunkett, Allan Barr, to General Electric Company. Adaptive acceleration responsive system. 4,075,538, Cl. 318-52.000.

Poindexter, Jack A.: *See—*
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Polaroid Corporation: *See—*
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Polatovskaya, Olga Grigorievna: *See—*
Bashkovich, Alexandr Pavlovich; Zimnukhova, Evgenia Semenovna; Prokopovich, Agnessa Vladimirovna; Polatovskaya, Olga Grigorievna; Pronina, Maria Ivanovna; Kulbakh, Valter Osvaldovich; Rivkina-Pevtsova, Khasya Ionovna; and Grinberg, Grigory Efimovich, 4,075,322, Cl. 424-94.000.

Politzer, Ernest L.; and Hayes, John C., to UOP Inc. Saturated hydrocarbon isomerization utilizing a catalyst of platinum group metal, cobalt, tin and halogen on a carrier. 4,075,259, Cl. 260-683.680.

Polster, Norman E., to Josam Manufacturing Co., a part interest. Hot gas engine control. 4,074,530, Cl. 60-518.000.

Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Rymareva, Tatyana Ivanovna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; and Alexeeva, Ljubov Antonovna. Fluorosiloxane diols and method of producing same. 4,075,168, Cl. 260-46.50R.

Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich. Fluorosiloxane rubbers and process for producing same. 4,075,170, Cl. 260-46.50G.

Ponsinet, Gerard: *See*—
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Pont-A-Mousson S.A.: *See*—
Negre, Robert Paul, 4,074,748, Cl. 164-292.000.

Pope, Gary A.: *See*—
Hill, Harold J.; Reisberg, Joseph; Helfferich, Fred G.; Lake, Larry W.; and Pope, Gary A., 4,074,755, Cl. 166-252.000.

Popowich, Michael John, to Du Pont de Nemours, E. I., and Company. Capacitor with noble metal electrodes. 4,075,681, Cl. 361-305.000.

Port, Eugene Baker; and Garofano, Norman Rutledge, to Allied Chemical Corporation. Purification of carbonate process solutions. 4,075,281, Cl. 423-206.00T.

Porter, Samuel, Jr.; and McBane, Bruce N., to PPG Industries, Inc. Carboxylic acid amide interpolymer-based coating compositions. 4,075,141, Cl. 260-17.200.

Portlock, David Edward, to Sharp Associates. Method of preparing β-dihydrothebaine. 4,075,132, Cl. 260-285.000.

Posnansky, Mario. Method and apparatus for heating a fluid medium by means of solar energy. 4,074,678, Cl. 126-271.000.

Post, Rodney Morris: *See*—
Lang, Robert S.; Post, Rodney Morris; and Hogan, Thomas Leo, 4,074,481, Cl. 52-169.800.

Powers, Mary: *See*—
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PPG Industries, Inc: *See*—
Schimmel, Karl F.; and Wismer, Marco, 4,075,240, Cl. 260-471.00R.

PPG Industries, Inc.: *See*—
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Brzozowski, Stanley F.; and Cooper, Joseph E., 4,074,990, Cl. 65-27.000.
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Du Bois, Donald W.; and Darlington, William B., 4,075,070, Cl. 204-129.000.
Eilerman, George E.; and Tamosauskas, Albert E., 4,074,988, Cl. 65-3.00C.
Frank, Robert G., 4,074,995, Cl. 65-104.000.
Jozwiak, Edward L., Jr.; and Das, Suryya K., 4,075,135, Cl. 260-29.7DP.
Pater, Walter E.; and Rowley, James R., 4,074,823, Cl. 214-152.000.
Porter, Samuel, Jr.; and McBane, Bruce N., 4,075,141, Cl. 260-17.200.
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Rinehart, Jay K., 4,075,006, Cl. 71-100.000.
Zatmann, Jean, 4,075,148, Cl. 260-23.0EP.

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Yarwood, John C.; Dore, James E.; and Preuss, Robert K., 4,075,303, Cl. 264-44.000.

Price, Harold Arnold: *See*—
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Price International, Inc.: *See*—
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Priem, Jan Josef; and De Winter, Walter Frans, to AGFA-GEVAERT N.V. Polymerizable unsaturated oxazolidines and tetrahydro-1,3-oxazines and polymers thereof. 4,075,023, Cl. 96-114.000.

Prince Corporation: *See*—
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Gault, Terrell Wilson; and Maguire, Edward John, Jr., 4,075,118, Cl. 252-135.000.
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Prokopovich, Agnessa Vladimirovna: *See*—
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Pryor, Clyde Robert: *See*—
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Putman, Maurice W. Method for destructive distillation of hydrocarbonaceous materials. 4,075,083, Cl. 208-11.00R.

Quackenbush, Harold E.: *See*—
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Qualitrol Corporation: *See*—
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Queren, James. Doorway framing. 4,074,484, Cl. 52-214.000.

Quillfeldt, Winfried, to Jenoptik Jena G.m.b.H. Ignition electrode arrangement for gas discharge lamps, particularly for flash tubes. 4,075,537, Cl. 315-354.000.

Quinlan, Patrick M., to Petrolite Corporation. Use of cyclic thiazines as microbiocides. 4,074,999, Cl. 71-67.000.

Quinlan, Patrick M., to Petrolite Corporation. Polyquaternary ammonium methylene phosphonates. 4,075,243, Cl. 260-502.500.

R.C.M. Corporation: *See*—
Johnson, Arthur F., 4,075,284, Cl. 423-244.000.

R. Gelb & Sons, Inc.: *See*—
Schlosberg, Seymour, 4,074,752, Cl. 165-96.000.

R. O. Hull & Company, Inc.: *See*—
Eckles, William Edward; and Canaris, Valerie, 4,075,066, Cl. 204-55.00R.

Raber, Marvin: *See*—
Bruno, Stephen James; Dunn, Stephen Alfred; and Raber, Marvin, 4,075,059, Cl. 176-22.000.

Rabl, Carl-Roland, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Apparatus for investigating fast chemical reactions by optical detection. 4,074,939, Cl. 356-206.000.

Raddi, William J.: *See*—
Malchman, Franklin L.; Raddi, William J.; and Sharples, Susan, 4,074,720, Cl. 128-419.0PG.

Rahrig, Donald D.: *See*—
Hagedorn, Floyd T.; Rahrig, Donald D.; and Revells, Robert G., 4,074,996, Cl. 65-106.000.

Rait, Joseph M. Detector for alarm system. 4,075,616, Cl. 340-276.000.

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Ralston Purina Company: *See*—
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Rambauske, Werner R.; and Grabowski, John J., to Raytheon Company. Mirror and method of making same. 4,074,416, Cl. 29-527.400.

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Rampe, John F., to Rampe Research. Vibratory finishing system. 4,074,466, Cl. 51-163.100.

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Raphael, Rouchdy B. Rotation apparatus for work pieces. 4,074,600, Cl. 83-411.00R.

Rapistan Incorporated: *See*—
Bodewes, Hermanus J. A., 4,074,805, Cl. 198-790.000.

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Ray, George F., III, to Liskey Archectural Mfg. Inc. Elevated floor assembly. 4,074,488, Cl. 52-263.000.

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Ray, Louis F. Loading/unloading crane with buoyant counterweight system. 4,074,818, Cl. 214-13.000.

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Lofdahl, Clyde A., 4,074,420, Cl. 29-628.000.

Raymond Lee Organization, Inc., The: *See*—
Catlett, Richard E., 4,074,458, Cl. 43-139.000.
Garcia, Beltran L., 4,075,615, Cl. 340-227.100.
Williams, E. Elaine, 4,075,457, Cl. 219-218.000.

Raytheon Company: *See*—
Das, Dilip K., 4,075,042, Cl. 148-103.000.
Davis, Warren C., 4,075,415, Cl. 174-50.520.
Lelke, Helmut, 4,075,695, Cl. 364-200.000.
Nissen, Stanley M.; and Wallach, Steven J., 4,075,687, Cl. 364-200.000.
Rambauske, Werner R.; and Grabowski, John J., 4,074,416, Cl. 29-527.400.
Shapiro, Gerald N.; Goldstone, Bertram J.; Simone, Joseph D.; and Spignese, Edward E., 4,075,630, Cl. 343-5.0DP.
Tancrell, Roger H.; Stoner, William W.; and Wilson, David T., 4,075,483, Cl. 250-363.00S.

Razzano, John S., to General Electric Company. Fluorosiloxydiphenylsiloxy block copolymers. 4,075,169, Cl. 260-46.50R.
RCA Corporation: *See—*
Crandall, Richard Seely; and Faughnan, Brian Wilfred, 4,075,610, Cl. 365-107.000.
Oberman, Joel Roy; and Stewart, Roger Green, 4,075,690, Cl. 365-156.000.
Robe, Thomas Joseph, 4,075,575, Cl. 330-259.000.
Reago, Robert V.: *See—*
Wu, Paul S.; and Reago, Robert V., 4,075,461, Cl. 235-466.000.
Realex Corporation: *See—*
Magers, Wallace F.; and Jegen, James M., 4,074,861, Cl. 239-492.000.
Rechlicz, Thomas A., to PPG Industries, Inc. Method of sulfonating fluorocarbon polymers and fluorocarbon polymer produced thereby. 4,075,184, Cl. 260-79.30R.
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Hilley, Larry L.; and Neff, Marion W., 4,075,605, Cl. 340-146.3AC.
Recovery Systems, Inc.: *See—*
Link, Donald F., 4,074,868, Cl. 241-46.00R.
Redfern, Thomas P., to National Semiconductor Corporation. CMOS comparator circuit and method of manufacture. 4,075,509, Cl. 307-251.000.
Redmore, Derek; Outlaw, Benjamin T.; and Martin, Richard L., to Petrolite Corporation. Pyrophosphates. 4,075,291, Cl. 260-933.000.
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Murdoch, Henry W., 4,074,922, Cl. 308-8.200.
Reeher, John R.; Story, Michael S.; and Smith, Ronald D., to Finnigan Corporation. Focusing ion lens system for mass spectrometer for separating charged and neutral particles. 4,075,479, Cl. 250-281.000.
Rees, Norman E.: *See—*
Boyd, John B.; and Rees, Norman E., 4,074,406, Cl. 29-157.30C.
Rehnberg, Tore: *See—*
Borjesson, Anders; and Rehnberg, Tore, 4,074,422, Cl. 29-730.000.
Reid, Larry Ronald: *See—*
Arato, Paul; Lelkes, Antony; and Reid, Larry Ronald, 4,074,387, Cl. 15-322.000.
Reid, Philip Lane, to Riegel Textile Corporation. Apparatus for compressing and banding a predetermined number of articles. 4,074,508, Cl. 53-62.000.
Reid, Robert E.; and Wesner, Charles R., to Sperry Rand Corporation. Adaptive autopilot for marine vessels. 4,074,648, Cl. 114-144.0RE.
Reil, Wilhelm, to Altstadter Verpackungs-Vertriebs GmbH. Apparatus for producing containers. 4,074,961, Cl. 425-112.000.
Reilly, James J., Jr.: *See—*
Tanaka, John; and Reilly, James J., Jr., 4,075,312, Cl. 423-648.00A.
Reimann, Hans, to Schering Corporation. Monoesters of rosamicin for eliciting an antibacterial response. 4,075,331, Cl. 424-203.000.
Reines, Jose, to International Telephone and Telegraph Corporation. Line signalling over common highway for telecommunications system. 4,075,430, Cl. 179-18.00J.
Reinhard, Russell R.: *See—*
Dorawala, Tansukhlal G.; Reinhard, Russell R.; and Estes, John H., 4,075,255, Cl. 260-672.00R.
Reinke, Klaus: *See—*
Kunig, Helmut; and Reinke, Klaus, 4,074,394, Cl. 19-159.00R.
Reinschmidt, Robert Michael: *See—*
Millhollan, Michael Scott; and Reinschmidt, Robert Michael, 4,075,609, Cl. 365-154.000.
Reisberg, Joseph: *See—*
Hill, Harold J.; Reisberg, Joseph; Helfferich, Fred G.; Lake, Larry W.; and Pope, Gary A., 4,074,755, Cl. 166-252.000.
Reisdorf, Daniel: *See—*
Ducep, Jean Bernard; Farge, Daniel; Ponsinet, Gerard; and Reisdorf, Daniel, 4,075,328, Cl. 424-180.000.
Relyveld, Edgar Hans, to Agence Nationale de Valorisation de la Recherche (ANVAR). Vaccines, the process for preparing the same and the applications thereof. 4,075,321, Cl. 424-92.000.
Renaudin, Yves, to Societe Lannionnaise d'Electronique Sle-Citerel S.A. Telephone concentrator. 4,075,432, Cl. 179-18.0FC.
Rentmeester, Paul Clement: *See—*
Bergman, Mark Otho; and Rentmeester, Paul Clement, 4,074,575, Cl. 73-344.000.
Resag, Klaus: *See—*
Greve, Heinz Gunter; and Resag, Klaus, 4,075,409, Cl. 560-36.000.
Research Corporation: *See—*
White, Eugene W.; Hanusiak, William M.; and White, Rodney A., 4,075,092, Cl. 210-22.00R.
Retzlaff, Guenter: *See—*
Hamprecht, Gerhard; Schirmer, Ulrich; Wuerzer, Bruno; and Retzlaff, Guenter, 4,075,004, Cl. 71-91.000.
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Lipowski, Stanley A.; Dehn, Joseph W., Jr.; and Retzsch, Clinton E., 4,074,968, Cl. 8-94.220.
Reutling, Rolf Torgny; and Thysk, Nils Anders Rune, to Telefonaktiebolaget L M Ericsson. Method and apparatus for connecting conductors to terminals of an apparatus. 4,074,421, Cl. 29-628.000.
Revells, Robert G.: *See—*
Hagedorn, Floyd T.; Rahrig, Donald D.; and Revells, Robert G., 4,074,996, Cl. 65-106.000.
Rex, Albert Edward. Spring rail clamp. 4,074,860, Cl. 238-349.000.
Rexnord Inc.: *See—*
Hudis, Michael I., 4,074,802, Cl. 198-315.000.
Reynolds Metals Company: *See—*
Vickstrom, Donald E., 4,074,483, Cl. 52-202.000.
Rhone-Poulenc Industries: *See—*
Ducep, Jean Bernard; Farge, Daniel; Ponsinet, Gerard; and Reisdorf, Daniel, 4,075,328, Cl. 424-180.000.
Gielly, Jean-Francois, 4,075,305, Cl. 423-320.000.
Rhum, David; and Aluotto, Patrick F., to Celanese Corporation. Low molecular weight acrylates or methacrylates. 4,075,242, Cl. 560-190.000.
Richardson, Mason E.: *See—*
Haines, Walter E.; and Richardson, Mason E., 4,074,828, Cl. 220-254.000.
Richaud, Aime A.; Moreno, Pierre F.; and Rimbaud, Guy A., to L'Agence Nationale de Valorisation de la Recherche ANVAR. Ball screw. 4,074,585, Cl. 74-424.80R.
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Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcz, 4,075,249, Cl. 260-613.00D.
Ricks, John R.: *See—*
Gillespie, Robert M.; and Ricks, John R., 4,074,808, Cl. 209-73.000.
Ricoh Co., Ltd.: *See—*
Abe, Takeshi, 4,075,607, Cl. 340-152.00R.
Satomi, Toyokazu, 4,074,934, Cl. 355-14.000.
Rideout, Vincent L., to International Business Machines Corporation. Method for fabricating FET one-device memory cells with two layers of polycrystalline silicon and fabrication of integrated circuits containing arrays of the memory cells charge storage capacitors utilizing five basic pattern deliberating steps. 4,075,045, Cl. 148-187.000.
Ridyard, Denis Robert Annesley, to Imperial Chemical Industries Limited. 4(2'-Nitro-4'-sulfoanilino) phenyl azo hydroxyphenyl dyes. 4,075,200, Cl. 260-206.000.
Riegel Textile Corporation: *See—*
Reid, Philip Lane, 4,074,508, Cl. 53-62.000.
Righetti, Bruno: *See—*
Oehrli, Beat; Mettler, Max; and Righetti, Bruno, 4,075,229, Cl. 260-340.000.
Rikagaku Kenkyusho: *See—*
Shibata, Takehiko; Ando, Tadahiko; Kitsunai, Tokuji; Kamiyama, Norio; and Oikawa, Yoshifumi, 4,075,062, Cl. 195-103.50R.
Riken Piston Ring Kogyo Kabushiki Kaisha: *See—*
Maruyama, Masayuki; Hamada, Yoshitugu; and Yamauchi, Ryoichi, 4,074,956, Cl. 418-178.000.
Rimbaud, Guy A.: *See—*
Richaud, Aime A.; Moreno, Pierre F.; and Rimbaud, Guy A., 4,074,585, Cl. 74-424.80R.
Rinehart, Jay K., to PPG Industries, Inc. S-aryl N-alkynylthiolcarbamates. 4,075,006, Cl. 71-100.000.
Rinehart, Kenneth L., Jr.; McMillan, Moses W.; and Sobiczewski, Wojciech, to University of Illinois Foundation. Biologically active compounds. 4,075,339, Cl. 424-250.000.
Ringel, Helmut, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Device for separating in a continuous process particles from a first liquid and introducing the separated particles into a second liquid. 4,075,104, Cl. 210-402.000.
Risby, Terence H.; and Yergey, Alfred L., III, to Chemetron Corporation. Programmed thermal degradation-mass spectrometry analysis method facilitating identification of a biological specimen. 4,075,475, Cl. 250-282.000.
Ritter, Edmond Jean: *See—*
Kelly, Ralph; and Ritter, Edmond Jean, 4,075,318, Cl. 424-70.000.
Ritter, Fridolin Jacob; and Stein, Friedrich, to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid, Handel en Verkeer. Attractant for ants. 4,075,320, Cl. 424-84.000.
Ritter, Kaspar, to KOPAT Gesellschaft fur Konstruktion, Entwicklung und Patentverwertung m.b.H. & Co. KG. Winding mechanism-drive, particularly for construction cranes or like hoisting devices. 4,074,891, Cl. 254-150.0FH.
Rittinger, Gunter: *See—*
Storp, Klaus; Wirth, Hans; Rittinger, Gunter; and Hohmann, Volker, 4,075,282, Cl. 423-230.000.
RIV - SKF Officine de Villar Perosa S.p.A.: *See—*
Colanzi, Franco, 4,074,463, Cl. 49-352.000.
Rivers, Morris R.: *See—*
Helversen, Frederick D.; and Rivers, Morris R., 4,074,441, Cl. 34-122.000.
Rivkina-Pevtsova, Khasya Ionovna: *See—*
Bashkovich, Alexandr Pavlovich; Zimnukhova, Evgenia Semenovna; Prokopovich, Agnessa Vladimirovna; Polatovskaya, Olga Grigorievna; Pronina, Maria Ivanovna; Kulbakh, Valter Osvaldovich; Rivkina-Pevtsova, Khasya Ionovna; and Grinberg, Grigory Efimovich, 4,075,322, Cl. 424-94.000.
Roach, William John. Liquid metering device with adjustable stops. 4,074,831, Cl. 222-43.000.
Robe, Thomas Joseph, to RCA Corporation. Input stage for fast-slewing amplifier. 4,075,575, Cl. 330-259.000.
Robeller, Walter: *See—*
Nonnemacher, Gerhard; Knodel, Emil; Robeller, Walter; and Bosch, Paul, 4,074,955, Cl. 417-218.000.
Roberson, James H., to Crompton & Knowles Corporation. Fluid treating system for textile fibers. 4,074,546, Cl. 68-205.00R.
Robert Bosch GmbH: *See—*
Kuttner, Klaus; Kruger, Gunter; and Modic, Fedor, 4,075,416, Cl. 174-68.500.
Nonnemacher, Gerhard; Knodel, Emil; Robeller, Walter; and Bosch, Paul, 4,074,955, Cl. 417-218.000.
Zabler, Erich, 4,075,551, Cl. 324-208.000.

Robert Zapp, Werkzeug-und Maschinenfabrik GmbH: *See—*
Hochmuth, Walter; and Hollfelder, Hans Peter, 4,074,949, Cl. 407-114.000.

Roberts, Charles; and DeMichele, Ernest, to Mectronic Inc. Engine efficiency system. 4,074,670, Cl. 123-119.00E.

Roberts Corporation: *See—*
Cina, Ronald A.; and Kluge, Albert D., 4,074,744, Cl. 164-187.000.

Roberts, Paul Donald. Welding. 4,075,453, Cl. 219-125.100.

Roberts, Raymond P. Pocket razor and shave cream dispenser. 4,074,428, Cl. 30-41.000.

Roberts, Thomas G. Novel lathering device and razor assembly. 4,074,429, Cl. 30-41.000.

Roberts, William Walter, to Mobil Oil Corporation. Compressor. 4,074,954, Cl. 418-68.000.

Robertshaw Controls Company: *See—*
Brakebill, Harold G.; Lewis, Jay L.; and Asbill, Clarence M., III, 4,074,855, Cl. 236-87.000.
Cumming, Edward P., 4,074,588, Cl. 74-522.000.

Robertson, James A.: *See—*
Ferraro, Charles F.; Javick, Richard A.; and Robertson, James A., 4,075,369, Cl. 427-185.000.

Robillard, Edward George, to Cincinnati Milacron-Heald Corporation. Grinding machine control. 4,074,467, Cl. 51-165.920.

Robinson, Glen P., Jr.; Shelton, Samuel V.; and Hutchins, Samuel F., to Scientific-Atlanta, Inc. Solar collector apparatus and method. 4,074,705, Cl. 126-271.000.

Robson, Clive Gilroy: *See—*
Knowles, David Alan; and Robson, Clive Gilroy, 4,075,005, Cl. 71-94.000.

Rockwell International Corporation: *See—*
Boltinghouse, Joseph C.; and Atkinson, James L., 4,074,580, Cl. 74-5.60D.
Chen, Thomas T., 4,075,708, Cl. 365-2.000.
Chen, Thomas T.; and Gergis, Isoris S., 4,075,709, Cl. 365-2.000.
Clarke, John Elwood; Andrews, Austin M., II; Gertner, Edward R.; Longo, Joseph T.; and Pasko, John G., 4,075,043, Cl. 148-171.000.
Eden, Richard C., 4,075,576, Cl. 330-277.000.
Gergis, Isoris S., 4,075,611, Cl. 365-2.000.
Hankosky, Andrew; and Schoeneweis, E. Frederick, 4,074,542, Cl. 64-30.00R.
Hinckley, William L., Jr., 4,075,513, Cl. 307-350.000.
Laubengayer, William C., 4,075,440, Cl. 175.3 S-.
Wright, Howard O., 4,075,569, Cl. 328-58.000.

Rodeghier, John H. Golf club and golf accessory carrier. 4,074,739, Cl. 150-1.50B.

Rody, Jean: *See—*
Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, 4,075,165, Cl. 260-45.80N.

Rohm and Haas Company: *See—*
Kilbourn, Edward E.; Peardon, David L.; and Ware, J. Edgar, 4,075,345, Cl. 424-263.000.
Kuyama, Hiroshi; and Higosaki, Nobuyuki, 4,075,326, Cl. 424-141.000.
Lane, Constance A.; and Koziar, Joseph C., 4,075,263, Cl. 260-873.000.

Rokach, Joshua; Atkinson, Joseph G.; and Rooney, Clarence S., to Merck & Co., Inc. Pyrrolo[2,1-b][3]benzazepines. 4,075,225, Cl. 260-326.310.

Roland, John F., to Kraft, Inc. Debittered protein product and method for manufacture. 4,075,195, Cl. 260-119.000.

Roll-Rite Corporation: *See—*
Christensen, Carl O., 4,074,407, Cl. 29-159.00R.

Rollei-Werke Franke & Heidecke: *See—*
Strauss, Karl-Peter; and Elke, Dietmar, 4,075,638, Cl. 354-23.00D.

Rollins, Ralph T., to Astron Innovations, Inc. Fuel control system for internal combustion engines. 4,074,664, Cl. 123-75.00B.

Rolston, George Angus: *See—*
Dorfman, Jan William; Carson, Michael David Nisbet; and Rolston, George Angus, 4,074,646, Cl. 114-39.000.

Roltra S.p.A.: *See—*
Brusasco, Enzo, 4,074,587, Cl. 74-424.80R.

Romanowski, Robert F., to Qualitrol Corporation. Pressure relief valve operation signal. 4,074,696, Cl. 137-553.000.

Rooney, Clarence S.: *See—*
Rokach, Joshua; Atkinson, Joseph G.; and Rooney, Clarence S., 4,075,225, Cl. 260-326.310.

Roscetti, Betty Ann: *See—*
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Rose, Andrew M.; and Tremaine, Brian Paul, to Sperry Rand Corporation. Method and apparatus for aligning read/write heads in a disc recorder. 4,075,667, Cl. 360-77.000.

Rose, Manning I. Safety socket for lamps and the like. 4,074,925, Cl. 339-44.00R.

Rosen, Perry: *See—*
Jernow, Jane Liu; and Rosen, Perry, 4,075,209, Cl. 260-256.40N.

Rosin, Stanley A. Device for securing cords, tubes, and the like. 4,074,397, Cl. 24-73.0AS.

Rostoker, David, to Pittsburgh Corning Corporation. Method of forming a potassium aluminoborosilicate frit. 4,075,025, Cl. 106-54.000.

Rostron, Joseph R., to Westinghouse Electric Corporation. Double-puffer-type compressed-gas circuit-interrupter constructions. 4,075,447, Cl. 200-148.00A.

Roth, Albert: *See—*
Lawrence, John C.; and Roth, Albert, 4,075,622, Cl. 340-347.0DD.

Roth, Andre: *See—*
Castagna, Herman; Gravey, Guy; and Roth, Andre, 4,075,277, Cl. 423-55.000.
Gravey, Guy; Grolla, Paul; and Roth, Andre, 4,075,278, Cl. 423-55.000.

Rothmann, Harry Edward: *See—*
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Roto-Finish Company: *See—*
Balz, Gunther W., 4,074,472, Cl. 51-313.000.

Rottmann, Dieter: *See—*
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Rousseau, Patrick M.: *See—*
Haag, Robert A.; Rousseau, Patrick M.; and Martin, Thom O., 4,075,356, Cl. 426-285.000.

Rowe, William Guy. Particle analyzer apparatus employing light-sensitive electronic detector array. 4,075,462, Cl. 235-92.0PC.

Rowley, James R.: *See—*
Pater, Walter E.; and Rowley, James R., 4,074,823, Cl. 214-152.000.

Rowlings, James W. Vehicle ignition switch lock device. 4,074,550, Cl. 70-237.000.

Roy, Dibyendu N.: *See—*
Jorgensen, Erik; Roy, Dibyendu N.; and Kondo, Edward S., 4,075,327, Cl. 424-273.00R.

Rubber and Plastics Research Association: *See—*
Sambrook, Ronald William; and Beesley, John Harold, 4,074,569, Cl. 73-15.600.

Rubbermaid Commercial Products Inc.: *See—*
Juergens, David A.; and Terek, Greg P., 4,074,810, Cl. 211-11.000.

Rucker, Joseph R.: *See—*
Daly, George W.; and Rucker, Joseph R., 4,074,883, Cl. 248-286.000.

Rudolph Beaver, Inc.: *See—*
Beaver, John R.; and Kozlowski, George J., 4,074,431, Cl. 30-353.000.

Ruf, Walter; and Rothmann, Harry Edward, to St. Regis Paper Company. Bag filling machine for powdery material. 4,074,507, Cl. 53-59.00W.

Rugge, Henry Ferdinand: *See—*
Link, William Trevor; Rugge, Henry Ferdinand; and Jansen, William David, 4,074,711, Cl. 128-2.05A.

Rule, Charles E.; and Werstak, Charles E., to SCM Corporation. Preparation of imitation mozzarella cheese. 4,075,360, Cl. 426-582.000.

Rullmann, Karl-Heinz: *See—*
Paulus, Wilfried; and Rullmann, Karl-Heinz, 4,075,245, Cl. 260-561.0HL.

Runyon, John F. Modular building structure. 4,074,477, Cl. 52-86.000.

Rushing, Jack L. Fluid vapor injector. 4,074,673, Cl. 123-198.00A.

Russell, Donald Henry: *See—*
Frisch, Kurt Charles; and Russell, Donald Henry, 4,075,181, Cl. 260-77.50B.

Russell, Rex Hamilton. Process for producing water soluble resins. 4,075,145, Cl. 260-22.00M.

Rutherford, Barry A. Drywall bead accessory. 4,074,478, Cl. 52-98.000.

Ryazanova, Rufina Mikhailovna: *See—*
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Rybakov, Jury Viktorovich: *See—*
Lysikov, Boris Vasilievich; Shabanov, Jury Nikolaevich; Rybakov, Jury Viktorovich; and Svetlova, Valentina Ivanovna, 4,075,036, Cl. 136-225.000.

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Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Rymareva, Tatyana Ivanovna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; and Alexeeva, Ljubov Antonovna, 4,075,168, Cl. 260-46.50R.
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S & S Research and Electronics: *See—*
LaDue, Donn; Winchurch, Robert J.; and Scaife, Gary R., 4,074,672, Cl. 123-198.0DC.

Saari, Kaarlo Matti Juhani; and Kalliokoski, Aarno Iisakki, to Outokumpu Oy. Flotation cell with eccentric rotor and stator. 4,075,089, Cl. 209-169.000.

Sabatino, Anthony; and Rao, Purushothama, to Gould Inc. Battery vent seal. 4,075,399, Cl. 429-57.000.

Sacco, John A.: *See—*
DiGiacomo, Hector L.; and Sacco, John A., 4,074,423, Cl. 29-730.000.

Sadler, James E., to United States of America, Air Force. Self-contained power subsystem. 4,074,527, Cl. 60-325.000.

Saether, Gustav, to Lyng Industrier A-S Leksvikarmatur. Dual handle mixing faucet. 4,074,697, Cl. 137-606.000.

Saffer, Harry E. Safety door latch mechanism. 4,074,915, Cl. 292-262.000.

Sagarino, Robert F.: *See*—
Koehler, Dale R.; Sagarino, Robert F.; and Sauter, Charles A., 4,075,518, Cl. 310-49.00R.

St. Regis Paper Company: *See*—
Ruf, Walter; and Rothmann, Harry Edward, 4,074,507, Cl. 53-59.00W.

Saito, Hisao; Tashiro, Norio; and Koinuma, Tokuju, to Tokyo Shibaura Electric Co., Ltd. Magnetron with holding means to support a pair of permanent magnets. 4,075,534, Cl. 315-39.710.

Saito, Masaaki; and Okamura, Kenji. Carburetor accelerating fuel circuit means. 4,075,294, Cl. 261-34.00A.

Sakaguchi, Mitsuo; Iwasaki, Hikoji; and Shimoya, Shigeo, to Kobishi Electric Co., Ltd. Alarm buzzer. 4,075,626, Cl. 340-388.000.

Sakamaki, Hisashi; and Ohtani, Toshiyuki, to Canon Kabushiki Kaisha. Heating-fixing device. 4,075,456, Cl. 219-216.000.

Sakumoto, Hideki: *See*—
Namoto, Yoshiteru; and Sakumoto, Hideki, 4,075,670, Cl. 360-85.000.

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Kemmler, Lothar, 4,074,701, Cl. 137-625.660.

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Merritt, George Albert, Jr., 4,075,434, Cl. 179-99.000.

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Hofer, Kurt; and Tscheulin, Guenther, 4,075,163, Cl. 260-45.70P.

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Hashimoto, Hiroshi; Abe, Tetsuo; and Kato, Akira, 4,074,425, Cl. 29-813.000.

Sapunar, Zakhar Isaevich: *See*—
Glikman, Mark Leonovich; Sapunar, Zakhar Isaevich; Avrus, Albert Vladimirovich; Gorokhovsky, Vladilen Alexandrovich; Fainberg, Evgeny Borisovich; Ivanov, Vladimir Alexandrovich; Shirkevich, Tatyana Leonidovna; and Sizov, Vadim Mikhailovich, 4,074,994, Cl. 65-44.000.

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Melcher, Franz Josef, 4,074,781, Cl. 177-212.000.

Saruyama, Masao: *See*—
Igaki, Hiroyuki; Shibata, Yoshiki; and Saruyama, Masao, 4,074,973, Cl. 23-230.0PC.

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Sastre, David: *See*—
Bundy, Wayne M.; Berberich, Joseph P.; and Sastre, David, 4,075,030, Cl. 106-288.00B.

Sato, Hiroshi: *See*—
Takeda, Kouichi; Sato, Hiroshi; and Onishi, Toshimi, 4,074,556, Cl. 72-196.000.

Sato, Hitoshi; Watanabe, Hazime; Miura, Kazumasa; and Kudo, Koji, to Kawaguchiko Seimitsu Co., Ltd. Insects catcher assembly. 4,074,457, Cl. 43-113.000.

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Matake, Naomasa; Yoshimura, Tadayoshi; and Sato, Kuniaki, 4,074,947, Cl. 403-406.000.

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Kikuchi, Shoji; Endo, Takaya; Kagami, Teruo; and Sato, Ryosuke, 4,075,021, Cl. 96-95.000.

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Satomi, Toyokazu, to Ricoh Co., Ltd. Electrostatographic imaging method and apparatus for multiple copies. 4,074,934, Cl. 355-14.000.

Sauer, Hans, to Matsushita Electric Works, Ltd.; and Sauer, Hans, part interest to each. Electromagnetic relay and the manufacture thereof. 4,075,585, Cl. 335-78.000.

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Sauer, Louis E.; and Miller, Orville C., to Centenary Central, Inc. Means for producing die board and cutting rules for same. 4,074,595, Cl. 76-107.00C.

Sauter, Charles A.: *See*—
Koehler, Dale R.; Sagarino, Robert F.; and Sauter, Charles A., 4,075,518, Cl. 310-49.00R.

Sawachika, Yasumasa; Kawakami, Hiroshi; and Minegishi, Shuzo, to Kohkoku Chemical Industry Co., Ltd. Process for preparing flame retarding polyurethane foams. 4,075,137, Cl. 260-2.5AT.

Sawaki, Mikio; Iwataki, Isao; Hirono, Yoshihiko; and Ishikawa, Hisao, to Nippon Soda Company, Limited. Cyclohexane derivatives. 4,075,239, Cl. 260-464.000.

Scaife, Gary R.: *See*—
LaDue, Donn; Winchurch, Robert J.; and Scaife, Gary R., 4,074,672, Cl. 123-198.0DC.

Schaar, Charles H., to Colgate-Palmolive Company. Diaper with elastic fastener tab. 4,074,716, Cl. 128-287.000.

Schaefer, John T.: *See*—
Loest, Kent W.; and Schaefer, John T., 4,075,068, Cl. 204-93.000.

Schaefgen, John Raymond, to Du Pont de Nemours, E. I., and Company. Copolyesters capable of forming an anisotropic melt. 4,075,262, Cl. 260-860.000.

Schaper, Raymond Joseph, to Calgon Corporation. Functional ionene compositions and their use. 4,075,136, Cl. 260-2.00R.

Scheinecker, Alois: *See*—
Scheurecker, Werner; and Scheinecker, Alois, 4,074,745, Cl. 164-446.000.

Schelhaas, Ealbertus Willem; and Blokker, Eduard Johannes Cornelis Marie, to O & R Inktchemie N.V. Rapid-drying printing ink and a printing process using same. 4,075,143, Cl. 260-17.200.

Schenk, Kurt, to Maschinenfabrik Benniger AG. Apparatus for controlling application of warp sections during warping. 4,074,404, Cl. 28-185.000.

Scherbakov, Jury Ilich: *See*—
Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Kudryakov, Mikhail Nikolaevich; Tsipkis, Alexandr Moiseevich; Yakovlev, Vladimir Germogenovich; Averbukh, Alexandr Samoilovich; Scherbakov, Jury Ilich; Yakobson, Natalia Dmitrievna; Semikozov, Vyacheslav Fedorovich; Medvedev, Viktor Vladimirovich; Yartsev, Valery Vasilievich; Kaganov, July Davydovich; Kuznetsov, Vladimir Ivanovich; and Sinelnikov, Alexandr Iosifovich, 4,074,773, Cl. 173-23.000.

Schering Corporation: *See*—
Reimann, Hans, 4,075,331, Cl. 424-203.000.

Scherr, George H.: *See*—
Ainis, Herman; Lange, Charles F.; Mark, Abraham S.; and Scherr, George H., 4,075,315, Cl. 424-12.000.

Scheuermann, Horst; and Hettche, Albert, to BASF Aktiengesellschaft. Naphthalimide compounds and optical brighteners. 4,075,211, Cl. 260-270.00H.

Scheurecker, Werner; and Scheinecker, Alois, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Starter bar for guiding and extracting cast strands of various thicknesses. 4,074,745, Cl. 164-446.000.

Scheurecker, Werner; and Kagerhuber, Franz, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Supporting and guiding stand for continuously cast strands. 4,074,746, Cl. 164-442.000.

Schilling, Kurt; Schraudolph, Manfred; Thiele, Gerd; and Weber, Jurgen, to Siemens Aktiengesellschaft. Gas-insulated thyristor assembly. 4,075,682, Cl. 361-386.000.

Schimmel, Karl F.; and Wismer, Marco, to PPG Industries, Inc. Polysalts of polycarboxylic acid esters and hydrazine or hydrazides. 4,075,240, Cl. 260-471.00R.

Schindler, Robert, to Brammall, Inc. Flag seal including flattened side-wall and oval cable. 4,074,916, Cl. 292-307.00R.

Schirmer, Ulrich: *See*—
Hamprecht, Gerhard; Schirmer, Ulrich; Wuerzer, Bruno; and Retzlaff, Guenter, 4,075,004, Cl. 71-91.000.

Schlosberg, Seymour, to R. Gelb & Sons, Inc. Lubricant cooling apparatus. 4,074,752, Cl. 165-96.000.

Schluter, Bernard C.: *See*—
Castleman, B. Wayne; and Schluter, Bernard C., 4,075,550, Cl. 324-33.000.

Schmidt, Frederick O. G., to Allura Corporation. Lace and a method for its manufacture. 4,074,543, Cl. 66-193.000.

Schmidt, Gerhard: *See*—
Verger, Nathan; and Schmidt, Gerhard, 4,075,588, Cl. 335-207.000.

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Cavil, David T.; Hansen, Einar T.; and Schmidt, Henry J., 4,074,669, Cl. 123-148.0CC.

Schmidt, Manfred; Freitag, Dieter; and Nouvertne, Werner, to Bayer Aktiengesellschaft. Statistical mixtures of halogenated bisphenols with halogen-free bisphenols. 4,075,119, Cl. 252-182.000.

Schmidt, Paul Joseph: *See—*
Crounse, Nathan Norman; and Schmidt, Paul Joseph, 4,075,224, Cl. 260-326.14R.

Schmitt, Arnold J.: *See—*
Ely, Donald E.; and Schmitt, Arnold J., 4,075,056, Cl. 162-305.000.

Schmittle, Karl V.; and Starner, Keith E., to Borg-Warner Corporation. Heat transfer in pool boiling. 4,074,753, Cl. 165-184.000.

Schneider, Richard A.; Freed, Gerald L.; and Lipnick, Richard, to Lockheed Electronics Co., Inc. Power monitoring and load shedding system. 4,075,699, Cl. 364-492.000.

Schneider, Richard T.: *See—*
United States of America, National Aeronautics and Space Administration; Thom, Karlheinz; and Schneider, Richard T., 4,075,057, Cl. 176-39.000.

Schnell, Hans Gunther, to Van Kooten B.V. Diesel pile-driving ram. 4,074,776, Cl. 173-137.000.

Schoeneweis, E. Frederick: *See—*
Hankosky, Andrew; and Schoeneweis, E. Frederick, 4,074,542, Cl. 64-30.00R.

Scholl, Rolland D., to Towmotor Corporation. Height indicator and control for fork lift trucks. 4,074,794, Cl. 187-29.00A.

Schoonmaker, Townsend L. Self-cleaning fixed dredge. 4,074,535, Cl. 61-2.000.

Schrama-de Pauw, Agnes Desiree Maria: *See—*
Stevels, Albert Leendert Nicolaas; and Schrama-de Pauw, Agnes Desiree Maria, 4,075,495, Cl. 250-483.000.

Schraudolph, Manfred: *See—*
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Schroeder, Thaddeus, to General Motors Corporation. Electrical load outage detector. 4,075,592, Cl. 337-139.000.

Schroter, Herbert: *See—*
Wilhelm, Max; Eichenberger, Kurt; Schroter, Herbert; and Ostermayer, Franz, 4,075,208, Cl. 260-256.40C.
Wilhelm, Max; Eichenberger, Kurt; Schroter, Herbert; and Ostermayer, Franz, 4,075,335, Cl. 424-244.000.

Schubert, Keith E.; and Canevari, Louis T., to Pitney-Bowes, Inc. Postage meter conversion apparatus. 4,074,574, Cl. 74-335.000.

Schuck, James M.; and Lewis, Charles, Jr., to Monsanto Company. Serum albumin production. 4,075,197, Cl. 260-122.000.

Schuessler, Richard D.: *See—*
Schuessler, Walter E.; and Schuessler, Richard D., 4,074,365, Cl. 2-201.000.

Schuessler, Walter E.; and Schuessler, Richard D. Cap and method of manufacture. 4,074,365, Cl. 2-201.000.

Schulz, Martin, Jr., to Steadley Company, Inc. Foundation unit frame. 4,074,372, Cl. 5-263.000.

Schulze, Robert R.; and Ladd, Floyd R., to said Robert R. Schulze; by said Floyd R. Ladd. Cryogenic probe. 4,074,717, Cl. 128-303.100.

Schuster, Earl Eugene: *See—*
Aitchison, Lindsay Matthew; Sparks, Kenneth Arnold; and Schuster, Earl Eugene, 4,075,377, Cl. 428-95.000.

Schweinsberg, Dieter Klaus-Jurgen. Binder for data carrier holders. 4,074,450, Cl. 40-403.000.

Schweizer, Albert E.: *See—*
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Schwendeman, James L.: *See—*
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Schwuttke, Guenter Herbert: *See—*
Ciszek, Theodore Frank; and Schwuttke, Guenter Herbert, 4,075,055, Cl. 156-608.000.

Scientific-Atlanta, Inc.: *See—*
Robinson, Glen P., Jr.; Shelton, Samuel V.; and Hutchins, Samuel F., 4,074,705, Cl. 126-271.000.

SCM Corporation: *See—*
Close, Ralph E.; and Oroshnik, William, 4,075,257, Cl. 260-680.00R.
Rule, Charles E.; and Werstak, Charles E., 4,075,360, Cl. 426-582.000.

Scoggin, Jack S., to Phillips Petroleum Company. Separation process. 4,075,287, Cl. 260-878.00B.

Scott & Fetzer Company, The: *See—*
Broad, Roy M., 4,074,926, Cl. 339-60.00R.

Scott, Harold W., to Oil Recovery Corporation. Extraction method and apparatus. 4,074,758, Cl. 166-249.000.

Scott, Paul Howard, to Motorola, Inc. I^2L injector current source. 4,075,508, Cl. 307-213.000.

Sealed Air Corporation: *See—*
Keren, Eitan; and Brown, Harold J., 4,074,505, Cl. 53-28.000.

Seaman, Harry V., to American Technical Ceramics, division of Phase Industries Inc. Test fixture for miniature capacitors. 4,075,556, Cl. 324-60.00C.

Sebring, Michael: *See—*
Blair, James M.; Sebring, Michael; Underwood, Warren H.; and Bley, William P., 4,074,389, Cl. 17-11.000.

See, Francis R.: *See—*
Pearce, Godfrey R.; Breeden, William J.; and See, Francis R., 4,074,417, Cl. 29-570.000.

Seedorf, Jack H.; Hruda, Robert M.; and Abell, Donald E., to Hooker Chemicals & Plastics Corporation. Cell bypass switches for electrochemical cell systems. 4,075,448, Cl. 200-262.000.

Seidel, Peter, to Dragerwerk Aktiengesellschaft. Anesthetic vaporizer. 4,075,297, Cl. 261-104.000.

Seidewand, Edward H., to General Motors Corporation. Lock cylinder assembly. 4,074,547, Cl. 70-1.500.

Seiler, Klaus-Dieter: *See—*
Droste, Gunter; Seiler, Klaus-Dieter; and Stapel, Wilhelm, 4,074,645, Cl. 112-229.000.

Seipp, Emil: *See—*
Jager, Hans; and Seipp, Emil, 4,075,044, Cl. 148-175.000.

Sekiguchi, Nisuke, to Sekiguchi Seisakusho Co., Ltd. Fastenings suitable for personal ornaments. 4,074,400, Cl. 24-218.000.

Sekiguchi Seisakusho Co., Ltd.: *See—*
Sekiguchi, Nisuke, 4,074,400, Cl. 24-218.000.

Sekiya, Tetsuo: *See—*
Konno, Kazuhiko; Hayasi, Yosio; Taniyama, Eiji; and Sekiya, Tetsuo, 4,075,121, Cl. 252-407.000.

Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Acidic copolymers based on glycidyl allyl polyethers adapted for anionic electrodeposition. 4,075,133, Cl. 260-29.300.

Sela, Michael; Arnon, Ruth; and Chaitchik, Samario, to Yeda Research and Development Co., Ltd. Novel synthetic undecapeptide and clinical assay. 4,075,194, Cl. 260-112.50R.

Semikozov, Vyacheslav Fedorovich: *See—*
Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Kudryakov, Mikhail Nikolaevich; Tsipkis, Alexandr Moiseevich; Yakovlev, Vladimir Germogenovich; Averbukh, Alexandr Samoilovich; Scherbakov, Jury Ilich; Yakobson, Natalia Dmitrievna; Semikozov, Vyacheslav Fedorovich; Medvedev, Viktor Vladimirovich; Yartsev, Valery Vasilievich; Kaganov, July Davydovich; Kuznetsov, Vladimir Ivanovich; and Sinelnikov, Alexandr Iosifovich, 4,074,773, Cl. 173-23.000.

Semm, Kurt. Method of and device for causing blood coagulation. 4,074,719, Cl. 128-303.100.

Senior, Ascanius John; and Heaps, John Bernard, to Senior, Ascanius John. Lure. 4,074,657, Cl. 119-29.000.

Sequin, Carlo Heinrich, to Bell Telephone Laboratories, Incorporated. Sensing circuit for semiconductor charge transfer devices. 4,075,514, Cl. 307-355.000.

Seto, Yutaka: *See—*
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Seymour Manufacturing Co., Inc.: *See—*
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Shabanov, Jury Nikolaevich: *See—*
Lysikov, Boris Vasilievich; Shabanov, Jury Nikolaevich; Rybakov, Jury Viktorovich; and Svetlova, Valentina Ivanovna, 4,075,036, Cl. 136-225.000.

Shafer, Homer J. Pipeline break shutoff control. 4,074,692, Cl. 137-488.000.

Shah, Raj: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,075,133, Cl. 260-29.300.

Shank, Herbert C., Jr., to Anchor Hocking Corporation. Method of making color decorated, plastic coated glass articles. 4,075,363, Cl. 427-27.000.

Shannon, James L.: *See—*
Howard, Lawrence F.; Mills, James W.; and Shannon, James L., 4,074,385, Cl. 15-180.000.

Shaparew, Vladimir. Air ventilator for beehives. 4,074,378, Cl. 6-1.000.

Shapiro, Gerald N.; Goldstone, Bertram J.; Simone, Joseph D.; and Spignese, Edward E., to Raytheon Company. Signal processor. 4,075,630, Cl. 343-5.0DP.

Sharer, John C.: *See—*
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Sharp Associates: *See—*
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Sharples, Susan: *See—*
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Shaw, Milton C.: *See—*
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Shaw, Wilfrid G.: *See—*
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Sheff, Richard M. Electronic siren structure and method. 4,075,624, Cl. 340-384.00E.

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Hill, Harold J.; Reisberg, Joseph; Helfferich, Fred G.; Lake, Larry W.; and Pope, Gary A., 4,074,755, Cl. 166-252.000.

Shelton, Samuel V.: *See—*
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Shepherd, David: *See—*
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Sheppard, Chester Stephen: *See—*
MacLeay, Ronald Edward; Sheppard, Chester Stephen; and Lange, Harold Carl, 4,075,199, Cl. 260-192.000.
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Sherman, Irving R. Programmed flap system for an aircraft having wings. 4,074,878, Cl. 244-183.000.

Shibata, Takanori; and Marumoto, Katsuji, to Keishin Matsumoto.

Direct current motor control device for use in battery automobiles. 4,075,541, Cl. 318-139.000.
Shibata, Takehiko; Ando, Tadahiko; Kitsunai, Tokuji; Kamiyama, Norio; and Oikawa, Yoshifumi, to Rikagaku Kenkyusho. Throw-in type colorimeter. 4,075,062, Cl. 195-103.50R.
Shibata, Tatsumi: *See—*
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Shibata, Yoshiki: *See—*
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Shigeta, Junnosuke; and Munehiro, Tomiji, to Matsushita Electric Industrial Co., Ltd. Keyboard operated electronic musical instrument. 4,074,605, Cl. 84-1.220.
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Shimizu, Shinkichi: *See—*
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Takamizawa, Minoru; Yamamoto, Yasushi; Inoue, Yoshio; Noshiro, Atsumi; and Fujii, Hitoshi, 4,075,167, Cl. 260-46.50E.
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Shinoda, Nobuhiko; and Kusumoto, Tadao, to Canon Kabushiki Kaisha. Data control device for selectively providing data to a processing system. 4,075,696, Cl. 364-404.000.
Shinohara, Yukio; and Ueno, Kuniki, to Mitsui Mining & Smelting Co., Ltd. Processes for preventing the generation of a mist of electrolyte and for recovering generated gases in electrowinning metal recovery, and electrodes for use in said processes. 4,075,069, Cl. 204-106.000.
Shinshu Seiki Kabushiki Kaisha: *See—*
Futagawa, Yoshikiyo; Kubota, Kanemitsu; and Kamakura, Hiroshi, 4,075,623, Cl. 340-347.0NT.
Shintani, Tutomu: *See—*
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Shipp, Roy L., Jr., to United States of America, Energy. Capacitance densitometer for flow regime identification. 4,075,680, Cl. 361-285.000.
Shiraishi, Tatsuo; Shimizu, Shinkichi; and Shindo, Tadashi, to Sumitomo Chemical Company, Limited. Selective removal of nitrogen oxides from waste gases containing sulfur oxides. 4,075,283, Cl. 423-239.000.
Shirakawa, Kazuhiro: *See—*
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Shivers, Norman E., Jr.; Shivers, David E.; and Shivers, Paul N. Stump cutting and precision digging apparatus. 4,074,447, Cl. 37-2.00R.
Shivers, Paul N.: *See—*
Shivers, Norman E., Jr.; Shivers, David E.; and Shivers, Paul N., 4,074,447, Cl. 37-2.00R.
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SI Handling Systems, Inc.: *See—*
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Siebol, George, to Armco Steel Corporation. Blind spacer fastener. 4,074,608, Cl. 85-71.000.
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Siemens Aktiengesellschaft: *See—*
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Sloan, Benjamin Johnston, Jr., to Texas Instruments Incorporated. Integrated logic circuit and method of fabrication. 4,075,039, Cl. 148-1.500.
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Smith, David G., to GSW Limited/Limitee. End cap assembly for an appliance control panel. 4,074,825, Cl. 220-4.00R.
Smith, Duane R., to Caterpillar Tractor Co. Accumulator drain. 4,074,703, Cl. 137-798.000.

Smith, Floyd S., to Brown Company. Novel filter and method of making same. 4,075,107, Cl. 210-493.00R.
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Smits, Donald M.; Daley, Patrick J.; and Akerley, Arnold J., to Kendall Company, The. Breast pads. 4,074,721, Cl. 128-461.000.
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Snyder, Daniel S.; and Luzsicza, Steven O., to Gould Inc. Apparatus and method for indicating condition of a rotating body. 4,075,603, Cl. 340-58.000.
Snyder, David E., to U. S. Industries, Inc. Pilot valve. 4,074,688, Cl. 137-269.000.
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Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, to Ciba-Geigy Corporation. Stabilization of polymers by penta- or hexa-substituted 4-piperidinol derivatives. 4,075,165, Cl. 260-45.80N.
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White, James F.; Shaw, Wilfrid G.; and Applequist, Michael D., 4,075,124, Cl. 252-437.000.
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Stern, Ernest; Williamson, Richard C.; and Smith, Henry I., to Massachusetts Institute of Technology. Surface wave devices for processing signals. 4,075,706, Cl. 364-821.000.
Stern, Marvin J., to Alloy Metals, Inc. Nickel base brazing alloy. 4,075,009, Cl. 75-170.000.
Stevels, Albert Leendert Nicolaas; and Schrama-de Pauw, Agnes Desiree Maria, to U.S. Philips Corporation. X-ray luminescent screen. 4,075,495, Cl. 250-483.000.
Stevens, Carlile R. Capacitor charging system. 4,075,536, Cl. 315-241.00P.
Stevens, Francis Joseph, to General Electric Company. Programmable electrical apparatus containing a battery. 4,075,561, Cl. 324-149.000.
Stevens, Robert A., to Chevron Research Company. Bottom-hole gas-liquid separator. 4,074,763, Cl. 166-325.000.
Stevens, W. Gene, to Caterpillar Tractor Co. Compact transmission having a power takeoff shaft and hydraulically actuated clutches. 4,074,581, Cl. 74-15.660.
Stevens, W. Gene; and Windish, Willis E., to Caterpillar Tractor Co. Direct drive transmission with hydraulically actuated forward and reverse clutches. 4,074,592, Cl. 74-740.000.
Stewart, John S. Wood planer cutterhead design for reduced noise level. 4,074,737, Cl. 144-117.00R.
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Stipek, Charles J., Jr., to Bates Printing Specialties, Inc. Tamper proof lottery ticket. 4,074,911, Cl. 283-6.000.
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Stranahan, Robert L. Ice barrier for boats. 4,074,649, Cl. 114-219.000.
Straus, Jozef; and Szentesi, Otto Istvan, to Northern Telecom Limited. Method and apparatus for distortion reduction in optical communication systems. 4,075,474, Cl. 250-199.000.
Strauss, Karl-Peter; and Elke, Dietmar, to Rollei-Werke Franke & Heidecke. Camera with automatic exposure factor mechanism. 4,075,638, Cl. 354-23.00D.
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Jones, C. David; and Suarez, Tulio, 4,075,227, Cl. 260-330.500.
Suga, Shigeru. Xenon lamp with magnets on the electrodes. 4,075,528, Cl. 313-154.000.
Suga, Shigeru. Xenon lamp containing magnetic adsorbers inside the tube thereof. 4,075,529, Cl. 313-154.000.
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Suter, Alois Joseph. Casting head with toggle lever actuated valve. 4,074,834, Cl. 222-504.000.
Suzuki, Hideo; Ishiguro, Ginya; Mitsuhashi, Sadayuki; and Wakamatsu, Kazutoshi, to Nippon Telegraph and Telephone Public Corporation; and Nippon Electric Co., Ltd. Multicontact sealed electromagnetic coordinate selection device. 4,075,587, Cl. 335-112.000.
Suzuki, Masaaki; and Kasuga, Akira, to Fuji Photo Film Co., Ltd. Magnetic recording tapes with two-layered magnetic coating. 4,075,384, Cl. 428-212.000.
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Swearingen, Judson S. Shaft-rotor coupling. 4,074,946, Cl. 403-364.000.
Swimley, Ronald N., to Siron Industries, Inc. Clasp with enclosed pin. 4,074,396, Cl. 24-162.000.
Swiss Aluminium Ltd.: *See—*
Vinkovic, Josef; and Werner, Eugen, 4,075,015, Cl. 96-35.100.
Yarwood, John C.; Dore, James E.; and Preuss, Robert K., 4,075,303, Cl. 264-44.000.
Sybron Corporation: *See—*
Feigin, Robert, 4,074,970, Cl. 8-169.000.
Walsh, William J., 4,074,963, Cl. 432-250.000.
Systems Research Laboratories, Inc.: *See—*
Taylor, Francis M., 4,074,938, Cl. 356-160.000.
Szczesniak, Alina Surmacka; and Mao, Wei-Wen, to General Foods Corporation. Intermediate moisture meats. 4,075,357, Cl. 426-332.000.
Szeberenyi, Szabolcz: *See—*
Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcz, 4,075,249, Cl. 260-613.00D.
Szegedy, Robert J. Inertia power system. 4,075,542, Cl. 318-161.000.
Szentesi, Otto Istvan: *See—*
Straus, Jozef; and Szentesi, Otto Istvan, 4,075,474, Cl. 250-199.000.
Szporny, Laszlo: *See—*
Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcz, 4,075,249, Cl. 260-613.00D.
Szugda, Bernard. Waterproof joint. 4,074,943, Cl. 403-174.000.
Szymansky, Edward, Jr.: *See—*
Marchetti, Michael John; and Szymansky, Edward, Jr., 4,074,427, Cl. 30-34.100.
Tabana, Minoru; Narisawa, Shizuo; Mitsuno, Tatsuyuki; and Maki, Hiroshi, to Sumitomo Chemical Company, Limited. Rubber-modified polystyrene resin composition. 4,075,285, Cl. 260-876.00B.
Taccani, Riccardo. Method and apparatus for manufacturing separable sliding clasp fasteners. 4,074,413, Cl. 29-408.000.
Tachibana, Takeshi: *See—*
Kamo, Yoshihisa; Tachibana, Takeshi; and Ichimura, Masao, 4,075,425, Cl. 179-1.0GQ.
Tadros, Tharwat Fouad: *See—*
Drewe, Nigel Wyndham; Parker, Roger John; and Tadros, Tharwat Fouad, 4,075,002, Cl. 71-92.000.
Taiheiyo Kinzoku Kabushiki Kaisha: *See—*
Takahashi, Hirohiko; Otsuka, Yoshinao; Sato, Yuichiro; and Tsukamoto, Yoshiki, 4,074,747, Cl. 164-443.000.
Taiwan Ricoh Co., Ltd.: *See—*
Kurasawa, Makoto, 4,075,646, Cl. 354-209.000.

Tajima, Yoshio: *See—*
Koyama, Tsuneo; Sugiyama, Yuichi; Furuhama, Teruhide; Tajima, Yoshio; Kakiuchi, Hiroshi; Yamada, Kazuhiro; and Obara, Masaaki, 4,075,159, Cl. 260-42.470.

Takacs, James D. River ramp for hovercraft. 4,074,384, Cl. 14-1.000.

Takagi, Kenji: *See—*
Kadowaki, Koju; Takagi, Kenji; and Tanaka, Yoshiaki, 4,075,127, Cl. 252-470.000.

Takago, Toshio: *See—*
Itoh, Kunio; Takago, Toshio; Sato, Tamio; and Aoki, Hisashi, 4,075,154, Cl. 260-37.0SB.

Takahashi, Hirohiko; Otsuka, Yoshinao; Sato, Yuichiro; and Tsukamoto, Yoshiki, to Taiheiyo Kinzoku Kabushiki Kaisha. Continuous casting mold for metals. 4,074,747, Cl. 164-443.000.

Takahashi, Masatatsu: *See—*
Takasuka, Kaoru; Takahashi, Masatatsu; and Nishimura, Sadaji, 4,075,498, Cl. 250-562.000.

Takahashi, Takeshi; Yamazaki, Yoshio; and Kato, Koichi, to Takeda Chemical Industries, Ltd. β-1,3-Glucan derivatives. 4,075,405, Cl. 536-1.000.

Takahata, Fumio; Inagaki, Kazunori; and Hirata, Yasuo, to Kokusai Denshin Denwa Kabushiki Kaisha. Transmultiplexer. 4,075,429, Cl. 179-15.0BM.

Takamizawa, Kinya; Itamura, Einoshin; and Iinuma, Kazuhiro, to Tokyo Shibaura Electric Co., Ltd. Ultrasonic wave transmitting and receiving apparatus. 4,075,598, Cl. 340-1.00R.

Takamizawa, Minoru; Yamamoto, Yasushi; Inoue, Yoshio; Noshiro, Atsumi; and Fujii, Hitoshi, to Dai Nippon Printing Co., Ltd.; and Shin-Etsu Chemical Co., Ltd. Maleimido group-containing organosilicon compounds. 4,075,167, Cl. 260-46.50E.

Takashi, Masanori; and Yoshiyasu, Mitsuo, to Mitsubishi Petrochemical Company Limited. Method of making synthetic paper. 4,075,050, Cl. 156-229.000.

Takasuka, Kaoru; Takahashi, Masatatsu; and Nishimura, Sadaji, to Asahi Kasei Kogyo Kabushiki Kaisha. Non-woven fabric defect detecting device. 4,075,498, Cl. 250-562.000.

Takatuka, Kenzi: *See—*
Furukubo, Haruo; Takezi, Yasaburo; and Takatuka, Kenzi, 4,075,530, Cl. 313-229.000.

Takeda Chemical Industries, Ltd.: *See—*
Noguchi, Yukihide; Nishimura, Takeshi; Kishimoto, Jotaro; and Nishida, Yoshio, 4,074,654, Cl. 118-73.000.
Takahashi, Takeshi; Yamazaki, Yoshio; and Kato, Koichi, 4,075,405, Cl. 536-1.000.

Takeda, Kouichi; Sato, Hiroshi; and Onishi, Toshimi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for roll working. 4,074,556, Cl. 72-196.000.

Takeda, Yasuo, to Kabushiki Kaisha Mitutoyo Seisakusho. Profile indicator. 4,074,438, Cl. 33-174.00P.

Takeshita, Tetsuo: *See—*
Mukaemachi, Takuji; Takeshita, Tetsuo; Miyoshi, Tatsuru; and Kojima, Takafumi, 4,075,431, Cl. 179-18.0GF.

Taketani, Osamu, to Nippon Steel Corporation. Pipe clamp. 4,074,402, Cl. 24-268.000.

Takeuchi, Takeshi: *See—*
Masuda, Hajime; Takeuchi, Takeshi; Watanabe, Masakatsu; and Tomioka, Yukio, 4,075,628, Cl. 340-416.000.

Takezi, Yasaburo: *See—*
Furukubo, Haruo; Takezi, Yasaburo; and Takatuka, Kenzi, 4,075,530, Cl. 313-229.000.

Taller, Robert Arthur, to Union Carbide Corporation. Process for stabilizing pigment dispersions in urethane coatings. 4,075,152, Cl. 260-37.00N.

Tamosauskas, Albert E.: *See—*
Eilerman, George E.; and Tamosauskas, Albert E., 4,074,988, Cl. 65-3.00C.

Tan, Marshall: *See—*
Jones, Rufus S., Jr.; Tan, Marshall; and Choe, Eui Won, 4,075,269, Cl. 264-184.000.

Tanabe Kokoki Co., Ltd.: *See—*
Otani, Akira, 4,074,749, Cl. 164-326.000.

Tanabe, Yasuo, to Mitsubishi Chemical Industries Limited. Process for preparation of diacetoxybutene. 4,075,413, Cl. 560-244.000.

Tanaka, John; and Reilly, James J., Jr., to United States of America, Energy. Process for recovering evolved hydrogen enriched with at least one heavy hydrogen isotope. 4,075,312, Cl. 423-648.00A.

Tanaka, Taro: *See—*
Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, 4,074,661, Cl. 123-3.000.

Tanaka, Yoshiaki: *See—*
Kadowaki, Koju; Takagi, Kenji; and Tanaka, Yoshiaki, 4,075,127, Cl. 252-470.000.

Tancrell, Roger H.; Stoner, William W.; and Wilson, David T., to Raytheon Company. Multiple masking imaging system. 4,075,483, Cl. 250-363.00S.

Taniyama, Eiji: *See—*
Konno, Kazuhiko; Hayasi, Yosio; Taniyama, Eiji; and Sekiya, Tetsuo, 4,075,121, Cl. 252-407.000.

Tarbet, Cecil Sidney Charles, to Cecil Instruments Manufacturing Limited. Sample cell for use in the optical analysis of liquids. 4,074,940, Cl. 356-246.000.

Tarneja, Krishan S.; Johnson, Joseph E.; and Bartko, John, to Westinghouse Electric Corporation. Tailoring of recovery charge in power diodes and thyristors by irradiation. 4,075,037, Cl. 148-1.500.

Tasco S.p.A.: *See—*
Degasperi, Mario Marco, 4,075,604, Cl. 340-146.3AG.

Tashiro, Norio: *See—*
Saito, Hisao; Tashiro, Norio; and Koinuma, Tokuju, 4,075,534, Cl. 315-39.710.

Tassone, Joseph V.: *See—*
Kaplan, Martin; and Tassone, Joseph V., 4,074,383, Cl. 12-145.000.

Tatsumi, Yoshio; and Kadowaki, Tooru, to Kabushiki Kaisha Daini Seikosha. Gear train for a wrist watch. 4,074,517, Cl. 58-140.00R.

Taubert, Klaus; Benner, Reimund; and Judt, Friedrich, to Meyer, Roth & Pastor Maschinenfabrik GmbH. Apparatus for making a link-type conveyor belt. 4,074,518, Cl. 59-15.000.

Taylor, Donald M.: *See—*
Warren, Daniel E.; and Taylor, Donald M., 4,074,789, Cl. 182-37.000.

Taylor, Francis M., to Systems Research Laboratories, Inc. Optical dimension measuring device employing an elongated focused beam. 4,074,938, Cl. 356-160.000.

Taylor Machine Works, Inc.: *See—*
Monk, James T.; Hailey, James L.; and Boyles, Tonnie M., 4,074,801, Cl. 198-304.000.

Teagle, William Thomas. Machine for cutting hedges, grass and other arboreal growth. 4,074,510, Cl. 56-233.000.

Technical Research Affiliates, Inc.: *See—*
Ainis, Herman; Lange, Charles F.; Mark, Abraham S.; and Scherr, George H., 4,075,315, Cl. 424-12.000.

Teijin Limited: *See—*
Kobayashi, Isao; Asada, Yoshiharu; and Kumakawa, Shiro, 4,075,274, Cl. 264-290.00T.
Ozawa, Shuji; Nakagawa, Yasuo; Matsuda, Kichiro; Nishihara, Toshio; and Yunoki, Hideki, 4,075,172, Cl. 260-47.0CZ.

Tektronix, Inc.: *See—*
Gilbert, Barrie, 4,075,574, Cl. 330-257.000.
Janko, Bozidar, 4,075,533, Cl. 315-31.00R.

Telefonaktiebolaget L M Ericsson: *See—*
Ericsson, Ernst Enoch, 4,075,694, Cl. 364-200.000.
Ghisler, Walter; Marlevi, Aleksander; and Anas, Johan Olof, 4,075,428, Cl. 179-15.0BS.
Johansson, Ake Ernst Elof; and Pahlen, Lars Christer, 4,075,683, Cl. 361-415.000.
Jonsson, Bjorn Erik Rutger; Andersson, Ulf Ivan Gunnar; and Bergman, Gustav Ruben, 4,075,466, Cl. 235-302.300.
Mattsson, Orjan Mats; and Widl, Walter Herbert Erwin, 4,075,427, Cl. 179-15.0BC.
Reutling, Rolf Torgny; and Thysk, Nils Anders Rune, 4,074,421, Cl. 29-628.000.

Teleglobe Pay-TV System, Inc.: *See—*
Horowitz, Irving, 4,075,660, Cl. 358-124.000.

Temme, Helmut: *See—*
Grundken, Dieter; and Temme, Helmut, 4,074,804, Cl. 198-735.000.

Tenney, Horace M.: *See—*
Mertzweiller, Joseph K.; and Tenney, Horace M., 4,075,251, Cl. 260-638.00B.

Teranishi, Haruo: *See—*
Ishikawa, Toshikatsu; Junichi, Tanaka; Teranishi, Haruo; and Kondo, Shinichiro, 4,075,114, Cl. 252-62.000.

Terek, Greg P.: *See—*
Juergens, David A.; and Terek, Greg P., 4,074,810, Cl. 211-11.000.

Tesson, Gerard: *See—*
Bonnet, Jean-Claude; and Tesson, Gerard, 4,075,177, Cl. 260-75.00T.

Tetenal Photowerk Walter Grabig: *See—*
Gerhardt, Wolfgang, 4,075,014, Cl. 96-22.000.

Tetrick, Elton Earl: *See—*
Funk, Buddy Keith; and Tetrick, Elton Earl, 4,075,465, Cl. 235-145.00R.

Texaco Development Corporation: *See—*
Naylor, Carter G.; and Yeakey, Ernest L., 4,075,130, Cl. 252-548.000.

Texaco Inc.: *See—*
Bousaid, Issam S., 4,074,759, Cl. 166-273.000.
Dorawala, Tansukhlal G.; Reinhard, Russell R.; and Estes, John H., 4,075,255, Cl. 260-672.00R.
Flournoy, Norman E., 4,075,601, Cl. 340-15.000.
Fuller, Matthew H.; and Deever, William R., 4,075,101, Cl. 210-275.000.
Slater, William L., 4,074,981, Cl. 48-197.00R.

Texas Instruments Incorporated: *See—*
Hanni, Stephen L.; and Johnson, Dudley B., 4,074,419, Cl. 29-625.000.
Sloan, Benjamin Johnston, Jr., 4,075,039, Cl. 148-1.500.
Squiers, David J.; and Obenhaus, Robert E., 4,075,674, Cl. 361-27.000.

Textron, Inc.: *See—*
Goldblatt, Lawrence; Weiss, Werner; and MacIntyre, Peter A., 4,074,604, Cl. 83-830.000.
Howe, Ralph S., Jr., 4,074,923, Cl. 308-236.000.
Kedzierski, Stanley G., 4,074,399, Cl. 24-205.14R.
Mait, Richard J., 4,074,512, Cl. 57-140.0BY.

Textube Corporation: *See—*
Fratturo, Jules P., 4,074,875, Cl. 242-118.300.

Therkildsen, Henry T.: *See—*
Hoehn, Richard F.; Morris, Hugh C.; Therkildsen, Henry T.; and Behrends, Bertwin E., 4,074,796, Cl. 192-3.570.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Ballast tamping implement on a mobile track tamper. 4,074,631, Cl. 104-12.000.

Theysohn, Friedrich. Method for coating foil material. 4,075,266, Cl. 264-92.000.

Thiele, Gerd: *See—*
Schilling, Kurt; Schraudolph, Manfred; Thiele, Gerd; and Weber, Jurgen, 4,075,682, Cl. 361-386.000.

Thill, William E. Eyeglasses having shapeable weighted temples. 4,074,932, Cl. 351-111.000.

Thizy, Andre; Pillon, Daniel; Debourge, Jean-Claude; and Lacroix, Guy, to Pepro. Fungicidal compositions containing phosphorous acid and derivatives thereof. 4,075,324, Cl. 424-128.000.

Tholander, Lars Helge Gottfrid; and Skogward, Kenneth Oscar Emanuel. Sewing machine. 4,074,641, Cl. 112-158.00D.

Thom, Karlheinz: *See—*
United States of America, National Aeronautics and Space Administration; Thom, Karlheinz; and Schneider, Richard T., 4,075,057, Cl. 176-39.000.

Thomas, David Charles, to Kerr-McGee Chemical Corporation. Antimony oxide pigment and process of manufacture. 4,075,032, Cl. 106-303.000.

Thomas, Donald Richard. Water heater-fireplace grate. 4,074,676, Cl. 126-132.000.

Thomas, Friedrich Werner, to Leybold-Heraeus GmbH & Co. KG. Apparatus for regulating the immersion depth of electrodes in electrode-melting furnaces. 4,075,414, Cl. 13-13.000.

Thomas, Raymond W.: *See—*
Willard, David A.; and Thomas, Raymond W., 4,074,411, Cl. 29-267.000.

Thomas Taylor & Sons, Inc.: *See—*
MacDonald, Harold B., 4,075,046, Cl. 156-73.100.

Thompson, Donald F., to Standard Oil Company (Indiana). Polypropylene/pelargonate divalent metal salt. 4,075,147, Cl. 260-23.00H.

Thompson, William D.: *See—*
Mandy, Stephen H.; and Thompson, William D., 4,075,353, Cl. 424-338.000.

Thomson-CSF: *See—*
Bouverot, Rene; and Narbaits-Jaureguy, Jean-Raymond, 4,075,553, Cl. 324-233.000.
Dumez, Bernard, 4,075,631, Cl. 343-6.50R.

Thor Power Tool Company: *See—*
Jonsson, Gregg N., 4,074,772, Cl. 173-12.000.

Thorn, Herbert; and Berkin, Harvey, to Ideal Toy Corporation. Doll simulating sucking action. 4,074,460, Cl. 46-135.00R.

Thulin, Robert R., to Nabisco, Inc. Method of forming perforated flat dough pieces. 4,075,359, Cl. 426-502.000.

Thuries, Edmond, to Delle-Alsthom S.A. Operating system for generator circuit-breakers. 4,075,673, Cl. 361-10.000.

Thuy, Nguyen Uyen, to Anvar Agence Nationale de Valorisation de la Recherche. Method of determining the position and connection of multi-pole windings for multi-speed electric machines. 4,075,543, Cl. 318-224.00R.

Thysk, Nils Anders Rune: *See—*
Reutling, Rolf Torgny; and Thysk, Nils Anders Rune, 4,074,421, Cl. 29-628.000.

Tidwell, Robert Wayne. Pest trap. 4,074,456, Cl. 43-98.000.

Tiep, Brian L., to City of Hope National Medical Center. Intrathoracic pressure biofeedback method. 4,074,710, Cl. 128-2.05P.

Tillyer, John N.: *See—*
Dunham, Philip N.; Tillyer, John N.; and Martin, Armand, 4,074,977, Cl. 44-38.000.

Timron, Inc.: *See—*
Kessler, Theodore P., 4,074,874, Cl. 242-77.100.

Tinney, Francis John, to Parke, Davis & Company. Hexapeptides. 4,075,189, Cl. 260-112.50R.

Titus, Theodore, IV: *See—*
Bolick, Fred C., Jr.; Titus, Theodore, IV; and Mohammadioun, Said, 4,075,436, Cl. 179-100.1DR.

Toia, Emilio: *See—*
Sale, Amedeo Omodie; Toia, Emilio; Galliani, Giulio; and Lerner, Leonard J., 4,075,342, Cl. 424-258.000.

Tokico Ltd.: *See—*
Hayashida, Yoshihiro; and Haraikawa, Tetsuo, 4,074,532, Cl. 60-562.000.

Tokura, Naomi; Masaki, Kenji; and Nagaisi, Hatuo, to Nissan Motor Company, Limited. Combination exhaust-gas cleaner and muffler for an automobile engine. 4,074,975, Cl. 23-288.00F.

Tokyo Denryoku Kabushiki Kaisha: *See—*
Ochiai, Tomoyoshi; Hayashi, Takeshi; and Furuse, Mituhiro, 4,075,697, Cl. 364-481.000.

Tokyo Juki Kogyo Kabushiki Kaisha: *See—*
Chano, Takashi; and Masuda, Kohji, 4,074,640, Cl. 112-121.110.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Saito, Hisao; Tashiro, Norio; and Koinuma, Tokuju, 4,075,534, Cl. 315-39.710.
Takamizawa, Kinya; Itamura, Einoshin; and Iinuma, Kazuhiro, 4,075,598, Cl. 340-1.00R.

Tomioka, Yukio: *See—*
Masuda, Hajime; Takeuchi, Takeshi; Watanabe, Masakatsu; and Tomioka, Yukio, 4,075,628, Cl. 340-416.000.

Tomoyoshi, Uchiya, to Uchiya Co., Ltd. Thermostat with reset arm. 4,075,594, Cl. 337-348.000.

Tong, Yulan C., to Dow Chemical Company, The. Microbicidal/fungicidal thiazolopyrazines. 4,075,207, Cl. 260-250.0BC.

Toray Industries, Inc.: *See—*
Igaki, Hiroyuki; Shibata, Yoshiki; and Saruyama, Masao, 4,074,973, Cl. 23-230.0PC.

Torikoshi, Takashi: *See—*
Horiie, Shigeki; Asai, Shin-Ichiro; Torikoshi, Takashi; Shirakawa, Kazuhiro; and Handa, Minoru, 4,075,253, Cl. 260-665.00R.

Torisawa, Akira, to Kabushiki Kaisha Daini Seikosha. Stepping motor for timepiece. 4,075,540, Cl. 318-138.000.

Torley, Jozsef: *See—*
Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcz, 4,075,249, Cl. 260-613.00D.

Torok, Ernest James, to Sperry Rand Corporation. Logic gate for cross-tie wall memory system incorporating isotropic data tracks. 4,075,613, Cl. 365-87.000.

Torstenfelt, Ragnar: *See—*
Mansson, Martin; and Torstenfelt, Ragnar, 4,074,520, Cl. 60-39.320.

Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcz, to Richter Gedeon Vegyeszeti Gyar RT. 3,4,5-Trimethoxy-α-ethynyl-benzhydrol as a fungicidally effective compound. 4,075,249, Cl. 260-613.00D.

Tower, Lee W.: *See—*
Lynch, David D., Jr.; and Tower, Lee W., 4,075,688, Cl. 364-200.000.

Towmotor Corporation: *See—*
Fatur, Richard N., 4,075,443, Cl. 200-85.00A.
Masevice, Frank V., 4,074,785, Cl. 180-68.500.
Scholl, Rolland D., 4,074,794, Cl. 187-29.00A.

Toy, Madeline S.; and Stringham, Roger S., to United States of America, Air Force. Method for the preparation of bis(perfluoro-t butyl) peroxide. 4,075,073, Cl. 204-158.00R.

Toyo Boseki Kabushiki Kaisha: *See—*
Fujiyoshi, Kanji; Mizumura, Yutaka; and Sono, Junji, 4,075,261, Cl. 260-850.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Ikeya, Taro, 4,074,524, Cl. 60-282.000.
Takeda, Kouichi; Sato, Hiroshi; and Onishi, Toshimi, 4,074,556, Cl. 72-196.000.

Traficante, Daniel D.; and Mulcay, Michael. Wide-band nuclear magnetic resonance spectrometer. 4,075,552, Cl. 324-0.5AH.

Trane Company, The: *See—*
Bergman, Mark Otho; and Rentmeester, Paul Clement, 4,074,575, Cl. 73-344.000.

Trapasso, Louis E.; and Horback, William B., to Celanese Corporation. Non-woven fabric binders. 4,075,387, Cl. 428-288.000.

Traver, Frank J.: *See—*
Brown, Edgar D., Jr.; and Traver, Frank J., 4,075,115, Cl. 252-75.000.

Tremaine, Brian Paul: *See—*
Rose, Andrew M.; and Tremaine, Brian Paul, 4,075,667, Cl. 360-77.000.

Trevedy, Jean-Louis, to Institut de Recherches de la Siderurgie Francaise (IRSID). Temperature detecting device for a furnace. 4,075,035, Cl. 136-210.000.

TRW Inc.: *See—*
Archer, John S., 4,074,731, Cl. 140-112.000.
Nelson, Paul T., 4,074,473, Cl. 52-1.000.
Steinke, James M., 4,074,800, Cl. 197-168.000.

Tsao, Utah, to Lummus Company, The. Waste heat recovery from high temperature reaction effluents. 4,074,660, Cl. 122-32.000.

Tsay, Yaw Jenn; and Lin, Kuo-Chuan. Solar powered distilling device. 4,075,063, Cl. 202-234.000.

Tscheulin, Guenther: *See—*
Hofer, Kurt; and Tscheulin, Guenther, 4,075,163, Cl. 260-45.70P.

Tsen, Lo Kwang; and Palkiewicz, John Louis, to General Electric Company. Epoxy resin compositions and laminate made therewith. 4,075,260, Cl. 260-830.0TW.

Tsipkis, Alexandr Moiseevich: *See—*
Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Kudryakov, Mikhail Nikolaevich; Tsipkis, Alexandr Moiseevich; Yakovlev, Vladimir Germogenovich; Averbukh, Alexandr Samoilovich; Scherbakov, Jury Ilich; Yakobson, Natalia Dmitrievna; Semikozov, Vyacheslav Fedorovich; Medvedev, Viktor Vladimirovich; Yartsev, Valery Vasilievich; Kaganov, July Davydovich; Kuznetsov, Vladimir Ivanovich; and Sinelnikov, Alexandr Iosifovich, 4,074,773, Cl. 173-23.000.

Tsubokawa, Yoshitoki: *See—*
Matsuda, Yoshio; and Tsubokawa, Yoshitoki, 4,074,398, Cl. 24-205.10C.

Tsukagawa, Yukio: *See—*
Kawakami, Hiroshi; Tsukagawa, Yukio; and Nagaoka, Isao, 4,075,096, Cl. 210-96.00R.

Tsukamoto, Yoshiki: *See—*
Takahashi, Hirohiko; Otsuka, Yoshinao; Sato, Yuichiro; and Tsukamoto, Yoshiki, 4,074,747, Cl. 164-443.000.

Tucker, Joseph M., III: *See—*
Gill, Stephen H.; Knell, Harvey A.; and Tucker, Joseph M., III, 4,074,820, Cl. 214-138.00R.

Turner, John Harry Wallice, to Manchem, Limited. Organoaluminum compositions. 4,075,178, Cl. 260-75.00T.

Turner, Michael K.: *See—*
Fleming, Ian D.; Turner, Michael K.; and Brewer, Stephen J., 4,075,061, Cl. 195-29.000.

Turner, Sam R.; and Stolka, Milan, to Xerox Corporation. Intrachain charge transfer complexes use in electrophotographic imaging. 4,075,012, Cl. 96-1.0PC.

U-Cart Concrete Systems, Inc.: *See—*
Hall, Jack F., 4,075,711, Cl. 366-26.000.

Uchiya Co., Ltd.: *See—*
Tomoyoshi, Uchiya, 4,075,594, Cl. 337-348.000.

Ueda, Hiroshi; and Yoshizaki, Akira, to Minolta Camera Kabushiki Kaisha. Camera with exposure control mechanism. 4,075,640, Cl. 354-31.000.

Uehara, Kenichiro, to Sumitomo Electric Industries, Ltd. Charged particle irradiation apparatus. 4,075,496, Cl. 250-492.00B.

Ueno, Katsuji: *See—*
Maruyama, Takashi; and Ueno, Katsuji, 4,075,173, Cl. 260-47.00C.

Ueno, Kuniki: *See—*
Shinohara, Yukio; and Ueno, Kuniki, 4,075,069, Cl. 204-106.000.

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Taller, Robert Arthur, 4,075,152, Cl. 260-37.00N.
Williams, David; Lentz, Brian A.; and Le Veque, Harold E., 4,074,856, Cl. 239-1.000.

Union Oil Company of California: *See—*
De Beau, Gerard Anthony; and Price, Harold Arnold, 4,074,734, Cl. 141-44.000.
Skripek, Milan; and Duir, John H., 4,075,084, Cl. 208-93.000.
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Uniroyal, AG: *See—*
van der Burg, Sjirk; Grosch, Karl A.; and Bertrand, Marcel J., 4,074,743, Cl. 152-355.000.

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Bakke, Even, 4,074,983, Cl. 55-118.000.

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Snyder, David E., 4,074,688, Cl. 137-269.000.

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Air Force: *See—*
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Briar, Herman P.; and Bills, Kenneth W., Jr., 4,074,563, Cl. 73-35.000.
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Holler, Richard P.; and McMath, Connie W., 4,074,523, Cl. 60-266.000.
Lowman, Richard M., Jr., 4,074,859, Cl. 239-265.330.
Sadler, James E., 4,074,527, Cl. 60-325.000.
Spencer, Stanley E., 4,074,908, Cl. 277-44.000.
Toy, Madeline S.; and Stringham, Roger S., 4,075,073, Cl. 204-158.00R.
Viets, Hermann, 4,074,568, Cl. 73-147.000.
Wells, H. David; Folsom, Gary J.; and Kaisler, Francis J., 4,074,964, Cl. 8-10.200.

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Merritt, James A., 4,075,072, Cl. 204-157.10R.
Rast, Gustaf J., Jr.; and Barley, Thomas A., 4,075,512, Cl. 307-311.000.
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Baldwin, Howard A.; Depp, Steven W.; Koelle, Alfred R.; and Freyman, Robert W., 4,075,632, Cl. 343-6.80R.
Groh, Edward F.; and Cassidy, Dale A., 4,074,848, Cl. 228-173.00C.
Shipp, Roy L., Jr., 4,075,680, Cl. 361-285.000.
Tanaka, John; and Reilly, James J., Jr., 4,075,312, Cl. 423-648.00A.

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Dillard, George M., 4,075,703, Cl. 364-715.000.
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Dyjak, Richard C., 4,074,650, Cl. 114-221.00A.
Horanoff, Eugene V., 4,074,567, Cl. 73-147.000.
Kershaw, Joseph E., 4,075,583, Cl. 333-73.00R.
Koenig, Harry J., 4,075,608, Cl. 340-166.00R.
Lawrence, John C.; and Roth, Albert, 4,075,622, Cl. 340-347.0DD.
Lewis, Bernard L., 4,075,633, Cl. 343-100.0LE.
Manning, Larry G.; and Zabelka, Richard J., 4,074,628, Cl. 102-6.000.
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Borne, Jean Paul; and Naaijer, Geert Jan, 4,075,665, Cl. 360-8.000.
Kowalski, Gunter, 4,075,490, Cl. 250-445.00T.
Louzil, Friedrich; Habelt, Gerhard; and Mrazek, Gustav, 4,075,669, Cl. 360-92.000.
Meyer-Ebrecht, Dietrich; and Kowalski, Gunter, 4,075,484, Cl. 250-366.000.
Perilhou, Jean Robert, 4,075,482, Cl. 250-363.00S.
Rath, Wilhelmus Johannes Franciscus; and van der Donk, Johannes Martinus Augustinus Henricus, 4,075,441, Cl. 200-16.00D.
Stevels, Albert Leendert Nicolaas; and Schrama-de Pauw, Agnes Desiree Maria, 4,075,495, Cl. 250-483.000.
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United States Steel Corporation: *See—*
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Capriotti, Alfred J.; Lazzaretti, Louis G.; and O'Donnell, Brian, 4,074,439, Cl. 33-286.000.
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Leonard, Ralph William, 4,075,008, Cl. 75-86.000.

United Technologies Corporation: *See—*
Beane, David J.; and Kaplan, Ronald M., 4,074,559, Cl. 72-354.000.
Bullis, Robert H.; Meyerand, Russell G., Jr.; and Wiegand, Walter J., Jr., 4,074,572, Cl. 73-194.00F.
Fradenburgh, Evan A.; and Yarm, Jay M., 4,074,952, Cl. 416-87.000.
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Politzer, Ernest L.; and Hayes, John C., 4,075,259, Cl. 260-683.680.
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Upjohn Company, The: *See—*
Greer, Richard L., 4,075,139, Cl. 260-2.50F.
Hester, Jackson B., Jr., 4,075,221, Cl. 260-308.00R.
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Nelson, Norman A., 4,075,247, Cl. 260-590.00C.

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Vainer, Ernesto A., to Manufactura de Articulos para el Hogar "Aurora" S.A. Industrial, Comercial, Inmobiliaria y Financiera. Electrode construction for a piezoelectric lighter. 4,074,962, Cl. 431-255.000.

Valint, Paul L., Jr.: *See—*
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Valleylab, Inc.: *See—*
Morrison, Charles F., Jr., 4,074,718, Cl. 128-303.140.

Valo, Veikko Lennart. Arrangement for a rotor barking machine. 4,074,738, Cl. 144-208.00E.

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van der Burg, Sjirk; Grosch, Karl A.; and Bertrand, Marcel J., to Uniroyal, AG. Radial tire with bead reinforcing elements. 4,074,743, Cl. 152-355.000.

van der Donk, Johannes Martinus Augustinus Henricus: *See—*
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van der Lely, Cornelis. Soil cultivating implements. 4,074,765, Cl. 172-59.000.

Van Doorne, Guy Camille, to Labofina S.A. Grease composition. 4,075,112, Cl. 252-35.000.

Van Doorne, Guy Camille, to Labofina S.A. Grease composition. 4,075,113, Cl. 252-35.000.
Vanguard, Inc.: *See*—
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Van Poucke, Raphael Karel: *See*—
Van Wignsberghe, Leo August, deceased; Zinzen, Agnes Maria, heir; Van Poucke, Raphael Karel; and Van Vugt, Jaak Pieter, 4,075,022, Cl. 96-100.00R.
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Van Wignsberghe, Leo August, deceased; by Zinzen, Agnes Maria, heir; Van Poucke, Raphael Karel; and Van Vugt, Jaak Pieter. Aqueous dispersions of photographic ingredients. 4,075,022, Cl. 96-100.00R.
Vardell, William G., Jr., to Westvaco Corporation. Recovery of crude tall oil. 4,075,188, Cl. 260-97.700.
Varian Associates, Inc.: *See*—
Anderson, Weston A., 4,074,564, Cl. 73-596.000.
James, Lawrence W., 4,075,651, Cl. 357-22.000.
Varta Batterie A. G.: *See*—
Salamon, Klaus; and Eckardt, Rudolf, 4,075,368, Cl. 429-161.000.
Varwig, Karlheinz, to DeMag Aktiengesellschaft. Turn-over cooling bed for bar-shaped rolled material, particularly billets. 4,074,815, Cl. 214-1.0QG.
Vassiliades, Anthony E.; and Vincent, David N., to Champion International Corporation. Opaque microcapsular release sheet. 4,075,389, Cl. 428-306.000.
Vaucher, Jean M., to Dynacore, S.A. Isochronous period generator having means for adjusting the isochronous period. 4,074,514, Cl. 58-23.0AC.
VEB Polygraph: *See*—
Werner, Hans-Dieter, 4,074,626, Cl. 101-221.000.
Veitscher Magnesitwerke-Actien-Gesellschaft: *See*—
Eustacchio, Peter, 4,075,311, Cl. 423-636.000.
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Vercellotti, Leonard C.: *See*—
Chaprnka, Anthony G.; Sun, Shan C.; and Vercellotti, Leonard C., 4,075,559, Cl. 324-115.000.
Verderber, Rudolph R., to Siemens Corporation. Single chip temperature compensated reference diode and method for making same. 4,075,649, Cl. 357-13.000.
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Scheurecker, Werner; and Kagerhuber, Franz, 4,074,746, Cl. 164-442.000.
Verge, John Pomfret; Neville, Martin Charles; and Friedman, Henry, to Eli Lilly and Company. 3-(5-Nitro-2-imidazolyl)pyrazoles. 4,075,222, Cl. 548-336.000.
Verger, Nathan; and Schmidt, Gerhard, to Alarm Device Manufacturing, Co. Switching apparatus. 4,075,588, Cl. 335-207.000.
Vermilion, Donn R.: *See*—
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Versar, Inc.: *See*—
Burlingame, Richard D.; and Markels, Michael, Jr., 4,075,370, Cl. 427-216.000.
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Vickery, James R.: *See*—
Bickford, Gardner Lloyd, 4,074,881, Cl. 248-188.700.
Vickstrom, Donald E., to Reynolds Metals Company. Apparatus for holding panels in a window construction. 4,074,483, Cl. 52-202.000.
Viets, Hermann, to United States of America, Air Force. Fluidic oscillating jet for high frequency gust tunnel. 4,074,568, Cl. 73-147.000.
Villain, Roland, to Societe Nationale Industrielle Aerospatiale. Titanium and titanium alloy surface preparation method for subsequent bonding. 4,075,040, Cl. 148-6.14R.
Vincent, David N.: *See*—
Vassiliades, Anthony E.; and Vincent, David N., 4,075,389, Cl. 428-306.000.
Vincent, Donald L.: *See*—
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Vinkovic, Josef; and Werner, Eugen, to Swiss Aluminium Ltd. Light sensitive mass and process for its production. 4,075,015, Cl. 96-35.100.
Virkus, Kenneth J., to General Cable Corporation. Bridging tape over lap seam cable shield. 4,075,419, Cl. 174-107.000.
Vollers, Charles S.: *See*—
Myers, John D.; and Vollers, Charles S., 4,075,120, Cl. 252-301.40P.
Vollmer Werke Maschinenfabrik GmbH: *See*—
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von Rintelen, Harald: *See*—
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Vopel, Karl Heinz; Hellrung, Friedrich; and Berendes, Otto, to Bayer Aktiengesellschaft. Production of O,O-dialkyl-phosphorochloridothionates. 4,075,292, Cl. 260-986.000.
Voss, Raymond O., to Corning Glass Works. Sodium ion-exchange on surface of beta-spodumene. 4,074,992, Cl. 65-30.00E.
Vredenburgh, Walter A.: *See*—
Douglas, Paul S.; Patellis, Anargiros Pete; and Vredenburgh, Walter A., 4,075,404, Cl. 526-237.000.
Vrieland, G. Edwin; and Friedli, Hans R., to Dow Chemical Company, The. Catalyst and method of oxydehydrogenation of alkyl aromatic compounds. 4,075,122, Cl. 252-437.000.
VSC Company, The: *See*—
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Whiteley, Isaac C., 4,074,681, Cl. 126-164.000.
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Wada, Tasaku, to Kokusai Denshin Denwa Kabushiki Kaisha. Step-by-step reciprocating mechanism. 4,075,539, Cl. 318-135.000.
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Wagle, Uday Dakornath; and Ramdas, Venkatram, to Pennwalt Corporation. Continuous manufacture of peroxyesters. 4,075,236, Cl. 260-453.0RZ.
Wahlquist, Carl D., to Building Components Research, Inc. Collapsible room module construction and method of assembly. 4,074,475, Cl. 52-70.000.
Wainer, Eugene, to Horizons Research Incorporated. Process for production of carbon monoxide and hydrogen. 4,074,980, Cl. 48-197.00R.
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Suzuki, Hideo; Ishiguro, Ginya; Mitsuhashi, Sadayuki; and Wakamatsu, Kazutoshi, 4,075,587, Cl. 335-112.000.
Walch, Axel; Klimmek, Albrecht; and Wollmann, Klaus, to Joh. A. Benckiser GmbH. Process of separating citric acid and/or isocitric acid or their salts from aqueous solutions. 4,075,093, Cl. 210-23.00H.
Walker, Ernest L., to International Business Machines Corporation. Surface acoustic wave device. 4,075,582, Cl. 333-72.000.
Walker, Ernest Lee, to International Business Machines Corporation. Analog-to-digital conversion apparatus. 4,075,577, Cl. 331-17.000.
Walker, James M.: *See*—
Van Bilderbeek, Bernard H.; Maingot, John E.; and Walker, James M., 4,074,912, Cl. 285-39.000.
Walker, Ralph Eldridge, to Litton Systems, Inc. Floating head encoder. 4,075,478, Cl. 250-231.0SE.
Wallach, Steven J.: *See*—
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Walley, Everette D., Jr., to General Signal Corporation. Monitoring device. 4,075,502, Cl. 307-64.000.
Walsh, William J., to Sybron Corporation. Kiln. 4,074,963, Cl. 432-250.000.
Walter, Jack W.: *See*—
Boodman, Norman S.; and Walter, Jack W., 4,075,254, Cl. 260-667.000.
Walther, Ronald Gene: *See*—
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Ward, Anthony T.; Damjanovic, Aleksandar; and Hair, Michael L. Electrophotochemical preparation of selenium photoconductive members. 4,075,013, Cl. 96-1.50R.
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Warren, Daniel E.; and Taylor, Donald M., to Armco Steel Corporation. Mobile rolling support system for scaffolding used in building construction. 4,074,789, Cl. 182-37.000.
Warren, Lyle D.; and Brewster, Robert W. Automatic sawmill. 4,074,601, Cl. 83-425.200.
Washabaugh, Edward P. Ladder rung implanter. 4,075,272, Cl. 264-249.000.
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Watanabe, Tomoyoshi: *See*—
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Watkins, David Vaughan, to Fidelity Radio Limited. Electrical control device. 4,075,568, Cl. 328-1.000.
Watson, Lawrence A., to Edgewater Marine, Inc. Method of making foam filled panels. 4,075,304, Cl. 264-46.500.
Watt, Robert Duncan; and Orr, Brian William Gordon. Brick laying device. 4,074,503, Cl. 52-749.000.
Watts, William R. Chair frame furniture unit. 4,074,919, Cl. 297-233.000.
Weatherford Oil Tool Company, Ltd.: *See*—
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Weck, Karl-Gustav, to Kieserling & Albrecht Werkzeugmaschinenfabrik. Infeed device for a turning machine for finishing the peripheral surfaces of elongated workpieces of cylindrical cross-section. 4,074,598, Cl. 82-20.000.
Weinblatt, Lee S. Eye movement monitoring apparatus. 4,075,657, Cl. 358-93.000.
Weinhold, Karl. Device for releasable fastening of tube or pipe ends. 4,074,913, Cl. 285-114.000.
Weirich, Walter; and Kussel, Willy, to Gewerkschaft Eisenhutte Westphalia. Pressure-relief valve devices. 4,074,695, Cl. 137-508.000.
Weiss, Werner: *See*—
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Wellendorf, Klaus, to Dr. -Ing. Rudolf Hell GmbH. Method for the rastered reproduction of half-tone pictures providing changes in the individual picture elements during transfer from an original to a reproduction. 4,075,663, Cl. 358-283.000.
Wells, H. David; Folsom, Gary J.; and Kaisler, Francis J., to United States of America, Air Force. Method of coloring hair using a pressure sensitive adhesive. 4,074,964, Cl. 8-10.200.
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Werner, Hans-Dieter, to VEB Polygraph. Method and apparatus for continuously printing uncased folded books. 4,074,626, Cl. 101-221.000.
Werstak, Charles E.: *See*—
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Wescott, Robert D.; and Christie, John B., to NCR Corporation. Symbol decoding method and means. 4,074,852, Cl. 235-463.000.
Wesner, Charles R.: *See*—
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West Electric Co., Ltd.: *See*—
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West, William S. Pressure source and systems incorporating it. 4,074,526, Cl. 60-325.000.
Western Electric Company, Inc.: *See*—
Bloxham, Gordon Foreman; Brezeale, Claude Paren; Cocco, Eugene Raymond; Hardesty, Edwin Charles; Small, Byron Lee; Steinert, Daniel Marion; and McGonigal, Charles, 4,075,299, Cl. 264-25.000.
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Duncan, Robert; and Barna, Richard P., 4,075,454, Cl. 219-137.00R.
Rostron, Joseph R., 4,075,447, Cl. 200-148.00A.
Tarneja, Krishan S.; Johnson, Joseph E.; and Bartko, John, 4,075,037, Cl. 148-1.500.
Westvaco Corporation: *See*—
Vardell, William G., Jr., 4,075,188, Cl. 260-97.700.
Whang, Sang Y.: *See*—
Nuchman, Benjamin; and Whang, Sang Y., 4,074,469, Cl. 51-217.00L.
Whirlpool Corporation: *See*—
Lotz, Lawrence C., 4,074,677, Cl. 126-198.000.
White, Allen A., to Hesston Corporation. Method and apparatus for binding a crop bale. 4,074,623, Cl. 100-3.000.
White, Derek Graham Walter: *See*—
Curry, Harold George; Attwood, Brian William; and White, Derek Graham Walter, 4,074,959, Cl. 425-81.100.
White, Donald A. Christmas tree fire detector and alarm. 4,075,614, Cl. 340-227.100.
White, Eugene W.; Hanusiak, William M.; and White, Rodney A., to Research Corporation. High surface area permeable material. 4,075,092, Cl. 210-22.00R.
White, James F.; Shaw, Wilfrid G.; and Applequist, Michael D., to Standard Oil Company, The. Process for the preparation of unsaturated acids from unsaturated aldehydes. 4,075,123, Cl. 252-437.000.
White, James F.; Shaw, Wilfrid G.; and Applequist, Michael D., to Standard Oil Company, The. Process for the preparation of unsaturated acids from unsaturated aldehydes. 4,075,124, Cl. 252-437.000.
White, James F.: *See*—
Dolhyj, Serge R.; Milberger, Ernest C.; and White, James F., 4,075,231, Cl. 260-346.400.
White, Rodney A.: *See*—
White, Eugene W.; Hanusiak, William M.; and White, Rodney A., 4,075,092, Cl. 210-22.00R.
Whiteley, Isaac C., to W-A Red Hot, Inc. Forced air circulation heating unit for fireplaces. 4,074,681, Cl. 126-164.000.
Wickersheim, Kenneth A., to Alves, Ronald, a part interest. Optical temperature measurement technique utilizing phosphors. 4,075,493, Cl. 250-461.00R.
Wicks & Nemer, P.A.: *See*—
Magiera, David L., 4,074,906, Cl. 273-243.000.
Widl, Walter Herbert Erwin: *See*—
Mattsson, Orjan Mats; and Widl, Walter Herbert Erwin, 4,075,427, Cl. 179-15.0BC.
Wiegand, Walter J., Jr.: *See*—
Bullis, Robert H.; Meyerand, Russell G., Jr.; and Wiegand, Walter J., Jr., 4,074,572, Cl. 73-194.00F.
Wieland, Erich Georg: *See*—
Eck, Norbert Otto; Stark, Siegfried Alfons; and Wieland, Erich Georg, 4,074,627, Cl. 101-425.000.
Wiesen, Ernest J.: *See*—
Lijewski, Robert R.; and Wiesen, Ernest J., 4,075,485, Cl. 250-369.000.
Wiesenfeld, Arnold: *See*—
Morton, Edgar J.; Donnan, Harold; and Wiesenfeld, Arnold, 4,075,117, Cl. 252-135.000.
Wiggers, Johannes Bernardus Maria: *See*—
Budde, Antonius Wilhelmus Hermanus; and Wiggers, Johannes Bernardus Maria, 4,074,953, Cl. 416-183.000.
Wight, James S.; Chudobiak, Walter J.; and Makios, Vassilios, to Canadian Patents and Development Limited. Electronic phase comparison apparatus for the remote measurement of layer thickness. 4,075,555, Cl. 324-58.50R.
Wilhelm, Max; Eichenberger, Kurt; Schroter, Herbert; and Ostermayer, Franz, to Ciba-Geigy Corporation. 1-Substituted-4-(2-oxohexahydro-1-pyrimidinyl)-piperidine. 4,075,208, Cl. 260-256.40C.
Wilhelm, Max; Eichenberger, Kurt; Schroter, Herbert; and Ostermayer, Franz, to Ciba-Geigy Corporation. Pharmaceutical piperidine derivatives. 4,075,335, Cl. 424-244.000.
Wilkens, Kenneth A. Wire cutting, stripping and twisting tool. 4,074,732, Cl. 140-120.000.
Wilkens, Richard W., to E-Systems, Inc. Self-memorizing data bus system for random access data transfer. 4,075,606, Cl. 340-147.00B.
Wilkerson, Edward D. Atom demonstrator. 4,074,443, Cl. 35-18.00A.
Wilkinson, Robert M., to Alton Box Board Company. Flexibility enhancing coating for boxboard, particularly of carton joints and fold lines, and method of application. 4,075,372, Cl. 427-258.000.
Wilkinson, Samuel: *See*—
Beddell, Christopher Raymond; Lowe, Lawrence Alfred; and Wilkinson, Samuel, 4,075,191, Cl. 260-112.5LH.
Willard, David A.; and Thomas, Raymond W. Ring removing wrench. 4,074,411, Cl. 29-267.000.
Willard, Goodman B.: *See*—
Guild, Charles L.; and Willard, Goodman B., 4,074,539, Cl. 61-53.720.
Willas, Raymond Zeno. Air filter. 4,074,985, Cl. 55-498.000.
Willdorf, Michael E., to Material Distributors Corporation. Security film for shatterproofing windows. 4,075,386, Cl. 428-216.000.
Wm. A. Nickerson & Co., Ltd.: *See*—
Keller, James R.; and Nickerson, William A., 4,074,498, Cl. 52-690.000.
William H. Rorer, Inc.: *See*—
Diamond, Julius, 4,075,354, Cl. 424-356.000.
Williams, David; Lentz, Brian A.; and Le Veque, Harold E., to Union Carbide Corporation. Greenhouse watering apparatus. 4,074,856, Cl. 239-1.000.
Williams, E. Elaine, to Raymond Lee Organization, Inc., The. Pedicure treatment unit. 4,075,457, Cl. 219-218.000.
Williams, Thomas Walter: *See*—
Eichelberger, Edward Baxter; Muehldorf, Eugen Igor; Walther, Ronald Gene; and Williams, Thomas Walter, 4,074,851, Cl. 235-302.000.
Williams, William O., Jr. Fishing lure. 4,074,455, Cl. 43-42.060.
Williamson, Richard C.: *See*—
Stern, Ernest; Williamson, Richard C.; and Smith, Henry I., 4,075,706, Cl. 364-821.000.
Willis, Barry G.: *See*—
Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 4,075,481, Cl. 250-343.000.
Wilmer, Michael E., to Xerox Corporation. Programmed device controller. 4,075,707, Cl. 364-900.000.
Wilson, Charles A.; and Mixan, Craig E., to Dow Chemical Company,

The. (1,3)Dithiolo-(4,5-b)thiazolo(4',5'-e)pyrazin-2-ylidene-propanedinitriles. 4,075,204, Cl. 260-250.0BC.
Wilson, Charles A.; and Mixan, Craig E., to Dow Chemical Company, The. (1,3-Dithiolo-(4,5-b) (1,2,5)thiadiazolo(3',4'-e)pyrazin-6-ylidene)-propanedinitrile. 4,075,205, Cl. 260-250.0BC.
Wilson, David T.: *See*—
Tancrell, Roger H.; Stoner, William W.; and Wilson, David T., 4,075,483, Cl. 250-363.0OS.
Wilson, Kermit H. Elevationally adjustable folding stage. 4,074,636, Cl. 108-113.000.
Winchurch, Robert J.: *See*—
LaDue, Donn; Winchurch, Robert J.; and Scaife, Gary R., 4,074,672, Cl. 123-198.0DC.
Winderman, Jay B.: *See*—
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Windish, Willis E.: *See*—
Stevens, W. Gene; and Windish, Willis E., 4,074,592, Cl. 74-740.000.
Winston, George. Cable-reinforced safety barrier. 4,075,473, Cl. 256-13.100.
Winters, Alden Bernard: *See*—
Bell, Graham Elsworth; and Winters, Alden Bernard, 4,074,491, Cl. 52-394.000.
Wireman, Wallace H. Alarm circuit for monitoring removal of plug from electrical power receptacle. 4,075,617, Cl. 340-280.000.
Wirth, Hans: *See*—
Storp, Klaus; Wirth, Hans; Rittinger, Gunter; and Hohmann, Volker, 4,075,282, Cl. 423-230.000.
Wismer, Marco: *See*—
Schimmel, Karl F.; and Wismer, Marco, 4,075,240, Cl. 260-471.00R.
Witco Chemical Corporation: *See*—
Morton, Edgar J.; Donnan, Harold; and Wiesenfeld, Arnold, 4,075,117, Cl. 252-135.000.
Witt, Alvin E.: *See*—
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Witz, Sidney R., to Witz, Sidney R. Foldable lampshade. 4,075,684, Cl. 362-352.000.
Wojtowicz, Jan: *See*—
Gray, Thomas J.; and Wojtowicz, Jan, 4,074,733, Cl. 141-32.000.
Wolber, Jorg, to U.S. Philips Corporation. Circuit arrangement for transmitting an alternating current oscillation having direct current components which can be changed abruptly. 4,075,570, Cl. 328-262.000.
Wolfangel, Robert G.; and Anderson, Howard A., to Mallinckrodt, Inc. Stannous pyrophosphate technetium-99m compositions. 4,075,314, Cl. 424-1.000.
Wolfe, Bruce Allen: *See*—
Galetto, Louis Valentine; Meier, Johann Hans; Pimbley, Walter Thornton; and Wolfe, Bruce Allen, 4,075,636, Cl. 346-75.000.
Wolff, Robert. Milling gauge. 4,074,736, Cl. 144-78.000.
Wollmann, Klaus: *See*—
Walch, Axel; Klimmek, Albrecht; and Wollmann, Klaus, 4,075,093, Cl. 210-23.00H.
Wong, Jacob Y.: *See*—
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Wood, Calvin T.: *See*—
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Wood, Thomas E.; and Wood, Calvin T. Internal frame backpack. 4,074,839, Cl. 224-8.00R.
Wood, William A., to Minnesota Mining and Manufacturing Company. Method of preparing retroreflective sheeting. 4,075,049, Cl. 156-220.000.
Woodrow, Harold E., to Morgan Construction Company. Laying pipe. 4,074,553, Cl. 72-66.000.
Woodward, Roger P., to GW Electronics, Inc. Apparatus and method for testing electrical surge arresters. 4,075,549, Cl. 324-28.00R.
Woolf, Cyril, deceased (by Woolf, Helga, executrix); Mares, Frank; and Oxenrider, Bryce C., to Allied Chemical Corporation. Fluorocarbon modification of fibers. 4,075,410, Cl. 560-87.000.
Woolf, Helga, executrix: *See*—
Woolf, Cyril, deceased; Mares, Frank; and Oxenrider, Bryce C., 4,075,410, Cl. 560-87.000.
Wright, A. Francis. Prophylactic article. 4,074,712, Cl. 128-79.000.
Wright, Ernest: *See*—
Gower, Stephen G. M.; Morris, Cyril R.; and Wright, Ernest, 4,074,976, Cl. 23-292.000.
Wright, Howard O., to Rockwell International Corporation. Digital method and apparatus for dynamically generating an output pulse train having a desired duty cycle from an input pulse train. 4,075,569, Cl. 328-58.000.
Wroblewski, Theodore, to Frequency Technology, Inc. Voltage regulating transformer. 4,075,547, Cl. 323-60.000.
Wu, Paul S.; and Reago, Robert V., to Litton Business Systems, Inc. UPC symbol decoding system. 4,075,461, Cl. 235-466.000.
Wuerzer, Bruno: *See*—
Hamprecht, Gerhard; Schirmer, Ulrich; Wuerzer, Bruno; and Retzlaff, Guenter, 4,075,004, Cl. 71-91.000.
Wust, Toni, to Meyer, Roth & Pastor Maschinenfabrik GmbH. Butt welding apparatus. 4,075,451, Cl. 219-51.000.
Xavier, Octavio Marques. Dispensing device. 4,074,944, Cl. 401-182.000.
Xerox Corporation: *See*—
Berg, Allan C.; Fitzpatrick, John W.; and Jones, Lewis O., 4,075,391, Cl. 428-407.000.
Berger, Michael A., 4,074,798, Cl. 197-53.000.
Murphy, Richard J., 4,075,390, Cl. 428-307.000.
Turner, Sam R.; and Stolka, Milan, 4,075,012, Cl. 96-1.0PC.
Wilmer, Michael E., 4,075,707, Cl. 364-900.000.
Xonics, Inc.: *See*—
Young, Robert A., 4,075,505, Cl. 307-88.300.
Xylander, Kurt. Water treatment apparatus. 4,075,076, Cl. 204-206.000.
Yabe, Akira, to Agency of Industrial Science & Technology. Method for preparing benzo[C]cinnoline and its derivatives. 4,075,074, Cl. 204-158.00R.
Yagi, Hideaki; and Hishiki, Tetsuo, to NGK Spark Plug Co. Ltd. Switch with electroluminescent indicator. 4,075,449, Cl. 200-315.000.
Yagupolsky, Lev Moiseevich: *See*—
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Rymareva, Tatyana Ivanovna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; and Alexeeva, Ljubov Antonovna, 4,075,168, Cl. 260-46.50R.
Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.
Yakobson, Natalia Dmitrievna: *See*—
Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Kudryakov, Mikhail Nikolaevich; Tsipkis, Alexandr Moiseevich; Yakovlev, Vladimir Germogenovich; Averbukh, Alexandr Samoilovich; Scherbakov, Jury Ilich; Yakobson, Natalia Dmitrievna; Semikozov, Vyacheslav Fedorovich; Medvedev, Viktor Vladimirovich; Yartsev, Valery Vasilievich; Kaganov, July Davydovich; Kuznetsov, Vladimir Ivanovich; and Sinelnikov, Alexandr Iosifovich, 4,074,773, Cl. 173-23.000.
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Yamada, Akinori: *See*—
Nohara, Tomiyasu; Matsuno, Yoshiyuki; Harada, Hisamitsu; and Yamada, Akinori, 4,074,440, Cl. 34-92.000.
Yamada, Kazuhiro: *See*—
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Yamaguchi, Yoshihiro: *See*—
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Yamamoto, Haruhisa: *See*—
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Yamamoto, Hisao: *See*—
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Yamanaka, Makoto: *See*—
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Yamauchi, Ryoichi: *See*—
Maruyama, Masayuki; Hamada, Yoshitugu; and Yamauchi, Ryoichi, 4,074,956, Cl. 418-178.000.
Yamazaki, Masahiko. Filtering device. 4,075,106, Cl. 210-487.000.
Yamazaki, Yoshio: *See*—
Takahashi, Takeshi; Yamazaki, Yoshio; and Kato, Koichi, 4,075,405, Cl. 536-1.000.
Yamshak, John R.: *See*—
Gross, William G.; Long, Henry A., Jr.; and Yamshak, John R., 4,074,655, Cl. 118-410.000.
Yamura Shinko Seisakusho Co., Ltd.: *See*—
Aoki, Ren; Fujiwara, Mitsugu; and Wada, Tasaku, 4,075,664, Cl. 358-286.000.
Yanagimoto, Samon; Aoyagi, Koshiro; Mizunuma, Susumu; and Nambu, Kouki, to Nippon Steel Corporation. Metal extrusion process with high reduction. 4,074,557, Cl. 72-206.000.
Yara Engineering Corporation: *See*—
Bundy, Wayne M.; Berberich, Joseph P.; and Sastre, David, 4,075,030, Cl. 106-288.00B.

Yarm, Jay M.: *See*—
Fradenburgh, Evan A.; and Yarm, Jay M., 4,074,952, Cl. 416-87.000.

Yartsev, Valery Vasilievich: *See*—
Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Kudryakov, Mikhail Nikolaevich; Tsipkis, Alexandr Moiseevich; Yakovlev, Vladimir Germogenovich; Averbukh, Alexandr Samoilovich; Scherbakov, Jury Ilich; Yakobson, Natalia Dmitrievna; Semikozov, Vyacheslav Fedorovich; Medvedev, Viktor Vladimirovich; Yartsev, Valery Vasilievich; Kaganov, July Davydovich; Kuznetsov, Vladimir Ivanovich; and Sinclnikov, Alexandr Iosifovich, 4,074,773, Cl. 173-23.000.

Yarwood, John C.; Dore, James E.; and Preuss, Robert K., to Swiss Aluminium Ltd. Method of preparation of ceramic foam. 4,075,303, Cl. 264-44.000.

Yates, Brian, to UOP Inc. Height adjustment mechanism for a vehicle seat. 4,074,886, Cl. 248-394.000.

Yawata, Teizaburo: *See*—
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Yeakey, Ernest L.: *See*—
Naylor, Carter G.; and Yeakey, Ernest L., 4,075,130, Cl. 252-548.000.

Yeda Research and Development Co., Ltd.: *See*—
Sela, Michael; Arnon, Ruth; and Chaitchik, Samario, 4,075,194, Cl. 260-112.50R.

Yee, Li Sze, to Kwoon Kwen Metal Ware Company Limited. Lock mechanism. 4,074,549, Cl. 70-7.000.

Yergey, Alfred L., III: *See*—
Risby, Terence H.; and Yergey, Alfred L., III, 4,075,475, Cl. 250-282.000.

Yevick, George J., to Personal Information Indexing Reader. Micro information indexing reader. 4,074,933, Cl. 353-27.00R.

Yie, Gene G.: *See*—
Burns, David J.; Mohaupt, Udo H.; and Yie, Gene G., 4,074,858, Cl. 239-172.000.

Yokohama Rubber Co., Ltd., The: *See*—
Koyama, Tsuneo; Sugiyama, Yuichi; Furuhama, Teruhide; Tajima, Yoshio; Kakiuchi, Hiroshi; Yamada, Kazuhiro; and Obara, Masaaki, 4,075,159, Cl. 260-42.470.

Yoon, Chong J. Collapsible tent frame. 4,074,682, Cl. 135-4.00R.

Yoshida Kogyo K. K.: *See*—
Nagase, Mitsuo, 4,074,490, Cl. 52-312.000.

Yoshida Kogyo Kabushiki Kaisha: *See*—
Matsuda, Yoshio; and Tsubokawa, Yoshitoki, 4,074,398, Cl. 24-205.10C.

Yoshimura, Tadayoshi: *See*—
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Yoshiyasu, Mitsuo: *See*—
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Yoshizaki, Akira: *See*—
Ueda, Hiroshi; and Yoshizaki, Akira, 4,075,640, Cl. 354-31.000.

Young, Bill M., to Halliburton Company. Oil well consolidation treating. 4,074,536, Cl. 61-36.00C.

Young, Dean Arthur, to Union Oil Company of California. Process for treating arsenic-containing hydrocarbon feedstocks. 4,075,085, Cl. 208-253.000.

Young, Robert A., to Xonics, Inc. Molecular emission lamp. 4,075,505, Cl. 307-88.300.

Yunoki, Hideki: *See*—
Ozawa, Shuji; Nakagawa, Yasuo; Matsuda, Kichiro; Nishihara, Toshio; and Yunoki, Hideki, 4,075,172, Cl. 260-47.0CZ.

Yurramendi Eguizabal, Jose Miguel. Device for automatically supplying drinks and foodstuffs. 4,075,463, Cl. 235-92.0AC.

Yuter, Seymour C. Restaurant dining system. 4,074,793, Cl. 186-1.00R.

Zabelka, Richard J.: *See*—
Manning, Larry G.; and Zabelka, Richard J., 4,074,628, Cl. 102-6.000.

Zabler, Erich, to Robert Bosch GmbH. Inductive displacement sensor. 4,075,551, Cl. 324-208.000.

Zagata, Robert J.; and Milberger, Ernest C., to Standard Oil Company, The. Preparation of maleic anhydride from n-butene in a one-reactor, fluid-bed system using two different catalysts. 4,075,232, Cl. 260-346.750.

Zak, Thomas Stephen, to Atlantic Richfield Company. Preparation of methyl ethyl ketone. 4,075,128, Cl. 252-475.000.

Zalay, Andrew W.: *See*—
Gelotte, Karl O.; Zalay, Andrew W.; and Bell, Malcolm R., 4,075,217, Cl. 260-296.00R.

Zanoni, Carl A., to Zygo Corporation. Optical measuring device. 4,074,937, Cl. 356-109.000.

Zatmann, Jean, to PPG Industries, Inc. Water-based coating compositions. 4,075,148, Cl. 260-23.0EP.

Zaugg, Alonzo N.; and Ellis, Richard W. Portable hanging scaffold. 4,074,792, Cl. 182-150.000.

Zengierski, Leon R.: *See*—
Mark, Victor; and Zengierski, Leon R., 4,075,238, Cl. 260-458.00C.

Zenith Radio Corporation: *See*—
Marino, Armando V., 4,075,531, Cl. 313-325.000.

Ziafop pri Ban: *See*—
Burov, Atanas Tzvetanov; Simidchieva, Penka Atanassova; and Kolev, Konstantin Nikolaev, 4,075,016, Cl. 96-48.0PD.

Zimmern, Bernard: *See*—
Clarke, Robert John; Hundy, Guy Francis; and Zimmern, Bernard, 4,074,957, Cl. 418-195.000.

Zimnukhov, Viktor Alexandrovich: *See*—
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Zimnukhov, Viktor Alexandrovich; Miroshnikova, Lidia Alexeevna; Kimel, Esfir Abramovna; Chefranova, Edit Konstantinovna; Guseva, Valentina Ivanovna; and Masagutova, Ljudmila Vladimirovna, 4,075,166, Cl. 260-45.95H.

Zimnukhova, Evgenia Semenovna: *See*—
Bashkovich, Alexandr Pavlovich; Zimnukhova, Evgenia Semenovna; Prokopovich, Agnessa Vladimirovna; Polatovskaya, Olga Grigorievna; Pronina, Maria Ivanovna; Kulbakh, Valter Osvaldovich; Rivkina-Pevtsova, Khasya Ionovna; and Grinberg, Grigory Efimovich, 4,075,322, Cl. 424-94.000.

Zinzen, Agnes Maria, heir: *See*—
Van Wignsberghe, Leo August, deceased; Zinzen, Agnes Maria, heir; Van Poucke, Raphael Karel; and Van Vugt, Jaak Pieter, 4,075,022, Cl. 96-100.00R.

Zondag, Nicolaas Abraham, to Explosive Metal Working Holland B.V. Methods and plugs to seal apertures in tube plates of heat exchangers provided with tube plates which are locally sealed with these methods and such plates. 4,074,630, Cl. 102-24.00R.

Zumwalt, Keith E., Sr.: *See*—
Marsh, Samuel W., III; and Zumwalt, Keith E., Sr., 4,075,086, Cl. 209-73.000.

Zygo Corporation: *See*—
Zanoni, Carl A., 4,074,937, Cl. 356-109.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF FEBRUARY, 1978

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Autoquip Corporation: *See—*
Richards, Lawrence I., Re. 29,542, Cl. 187-18.000.

Bantner, John A., to Information International Inc. Graphic symbol generator. Re. 29,550, Cl. 364-900.000.

Blass, Ishajahu: *See—*
Blass, Symcha; and Blass, Ishajahu, Re. 29,546, Cl. 285-14.000.

Blass, Symcha; and Blass, Ishajahu, to Blass, Ishajahu. Drip level irrigation. Re. 29,546, Cl. 285-14.000.

Chandler, Jack L.: *See—*
Payne, Dana C.; and Chandler, Jack L., Re. 29,548, Cl. 260-28.5AS.

Charles, Joseph T., to Coil Sales & Manufacturing Company. Package for encapsulated electrical components. Re. 29,549, Cl. 178-46.000.

Coil Sales & Manufacturing Company: *See—*
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Deisenroth, Robert J., to Excel Industries, Inc. Closure counterbalance. Re. 29,545, Cl. 267-71.000.

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55.1 R 4,074,619

CLASS 96

1 PC 4,075,012
1 R 4,075,011
1.5 R 4,075,013
22 4,075,014
35.1 4,075,015
39 4,075,018
48 HD 4,075,017
48 PD 4,075,016
88 4,075,019
94 R 4,075,020
95 4,075,021
100 R 4,075,022
114 4,075,023

CLASS 98

36 4,074,620

CLASS 99

286 4,074,621
456 4,074,622

CLASS 100

3 4,074,623
35 4,074,624

CLASS 101

128.1 4,074,625
221 4,074,626
425 4,074,627

CLASS 102

6 4,074,628
23 4,074,629
24 R 4,074,630

CLASS 104

12 4,074,631
130 4,074,632

CLASS 105

368 B 4,074,633
493 4,074,634

CLASS 106

53 4,075,024
54 4,075,025
97 4,075,026
99 4,075,027
186 4,075,028
288 B 4,075,029
4,075,030
300 4,075,031
303 4,075,032

CLASS 108

27 4,074,635
113 4,074,636

CLASS 109

38 4,074,637

CLASS 110

8 R 4,074,638

CLASS 111

6 4,074,639

CLASS 112

121.11 4,074,640
158 D 4,074,641
158 E 4,074,642
181 4,074,643
215 4,074,644
229 4,074,645

CLASS 114

39 4,074,646
102 4,074,647
144 RE 4,074,648
219 4,074,649
221 A 4,074,650
255 4,074,651

CLASS 115

35 4,074,652

CLASS 116

22 A 4,074,653

CLASS 118

73 4,074,654
410 4,074,655
502 4,074,656

CLASS 119

29 4,074,657
82 4,074,658
159 4,074,659

CLASS 122

32 4,074,660

CLASS 123

3 4,074,661
41.12 4,074,662
4,074,663
75 B 4,074,664
102 4,074,665
119 E 4,074,670
134 4,074,666
139 AF 4,074,668
139 AQ 4,074,667
148 CC 4,074,669
191 A 4,074,671
198 A 4,074,673
198 DC 4,074,672

CLASS 124

41 A 4,074,674

CLASS 126

41 R 4,074,675
121 4,074,679
132 4,074,676
142 4,074,680
164 4,074,681
198 4,074,677
270 4,074,704
271 4,074,678
4,074,705
4,074,706
343.5 A 4,074,707
360 A 4,074,708

CLASS 128

2 A	4,074,709
2.05 A	4,074,711
2.05 P	4,074,710
79	4,074,712
92 C	4,074,713
218 P	4,074,714
	4,074,715
287	4,074,716
303.1	4,074,717
	4,074,719
303.14	4,074,718
419 PG	4,074,720
461	4,074,721

CLASS 131

8 R	4,074,722
198 R	4,074,723
267	4,074,724

CLASS 134

6	4,075,033

CLASS 135

4 R	4,074,682
67	4,074,683

CLASS 136

89 PC	4,075,034
210	4,075,035
225	4,075,036

CLASS 137

1	4,074,684
101.11	4,074,685
247.19	4,074,686
266	4,074,687
269	4,074,688
270	4,074,689
344	4,074,690
382	4,074,691
454.6	4,074,693
488	4,074,692
505.41	4,074,694
508	4,074,695
553	4,074,696
606	4,074,697
614.06	4,074,698
625.27	4,074,700
625.64	4,074,699
625.66	4,074,701
	4,074,702
798	4,074,703

CLASS 139

1 R	4,074,725
29	4,074,726
435	4,074,727
	4,074,728
450	4,074,729
452	4,074,730

CLASS 140

112	4,074,731
120	4,074,732

CLASS 141

32	4,074,733
44	4,074,734
311 R	4,074,735

CLASS 144

78	4,074,736
117 R	4,074,737
208 E	4,074,738

CLASS 148

1.5	4,075,037
	4,075,038
	4,075,039
6.14 R	4,075,040
12.4	4,075,041
32	Re.29,547
103	4,075,042
171	4,075,043
175	4,075,044
187	4,075,045

CLASS 150

1.5 B	4,074,739
35	4,074,740

CLASS 152

237	4,074,741
330 A	4,074,742
355	4,074,743

CLASS 156

73.1	4,075,046
96	4,075,047
136	4,075,048
220	4,075,049
229	4,075,050
236	4,075,051
384	4,075,052
391	4,075,053
414	4,075,054
608	4,075,055

CLASS 162

305	4,075,056

CLASS 164

187	4,074,744
292	4,074,748
326	4,074,749
442	4,074,746
443	4,074,747
446	4,074,745

CLASS 165

89	4,074,750
92	4,074,751
96	4,074,752
184	4,074,753

CLASS 166

245	4,074,754
249	4,074,758
252	4,074,755
253	4,074,756
261	4,074,757
273	4,074,759
276	4,074,760
315	4,074,761
	4,074,762
325	4,074,763

CLASS 172

42	4,074,764
59	4,074,765
311	4,074,766
781	4,074,767
796	4,074,768
804	4,074,769
	4,074,770

CLASS 173

6	4,074,771
12	4,074,772
23	4,074,773
44	4,074,774
79	4,074,775
137	4,074,776
138	4,074,777

CLASS 174

50.52	4,075,415
68.5	4,075,416
84 C	4,075,417
107	4,075,419
117 F	4,075,420
120 SC	4,075,421

CLASS 175

52	Re.29,541
91	4,074,778
314	4,074,779
392	4,074,780

CLASS 176

21	4,075,058
22	4,075,059
37	4,075,060
39	4,075,057

CLASS 177

212	4,074,781

CLASS 178

23 R	4,075,422
46	Re.29,549

CLASS 179

1 GQ	4,075,425
1 H	4,075,426
1 SC	4,075,423
1 SG	4,075,424
15 BC	4,075,427
15 BM	4,075,429
15 BS	4,075,428
18 FC	4,075,432
18 GE	4,075,433
18 GF	4,075,431
18 J	4,075,430
99	4,075,434
100.1 DR	4,075,436
100.1 VC	4,075,435
100.41 K	4,075,418
114 R	4,075,437
146 H	4,075,438
175	4,075,439

CLASS 180

6.48	4,074,782
14 R	4,074,783
24	4,074,784
68.5	4,074,785
	4,074,786
82 B	4,074,787
89.12	4,074,788

CLASS 182

37	4,074,789
63	4,074,790
138	4,074,791
150	4,074,792

CLASS 186

1 R	4,074,793

CLASS 187

18	Re.29,542
29 A	4,074,794
29 R	Re.29,543

CLASS 188

73.3	4,074,795

CLASS 192

3.57	4,074,796

CLASS 195

29	4,075,061
103.5 R	4,075,062

CLASS 197

1 R	4,074,797
53	4,074,798
151	4,074,799
168	4,074,800

CLASS 198

304	4,074,801
315	4,074,802
670	4,074,803
735	4,074,804
790	4,074,805

CLASS 200

16 D	4,075,441
16 F	4,075,442
51.09	4,075,444
61.18	4,075,445
85 A	4,075,443
144 R	4,075,446
148 A	4,075,447
262	4,075,448
315	4,075,449

CLASS 202

234	4,075,063

CLASS 204

18 R	4,075,064
43 G	4,075,065
55 R	4,075,066
67	4,075,067
93	4,075,068
106	4,075,069
129	4,075,070
136	4,075,071
157.1 R	4,075,072
158 R	4,075,073
	4,075,074
159.17	4,075,075
206	4,075,076
269	4,075,077

CLASS 206

531	4,074,806
546	4,075,078

CLASS 208

8	4,075,079
	4,075,080
10	4,075,082
11 R	4,075,081
	4,075,083
93	4,075,084
253	4,075,085

CLASS 209

73	4,074,807
	4,074,808
	4,075,086
75	4,074,809
99	4,075,087
106	4,075,088
169	4,075,089
173	4,075,090

CLASS 210

19	4,075,091
22 R	4,075,092
23 H	4,075,093
62	4,075,094
82	4,075,095
96 R	4,075,096
168	4,075,097
	4,075,098
	4,075,099
266	4,075,100
275	4,075,101
277	4,075,102
331	4,075,103
402	4,075,104
477	4,075,105
487	4,075,106
493 R	4,075,107
500 M	4,075,108
527	4,075,109

CLASS 211

11	4,074,810
191	4,074,811
192	4,074,812

CLASS 213

24	4,074,813

CLASS 214

1 BB	4,074,814
1 QG	4,074,815
2	4,074,816
13	4,074,817
	4,074,818
83.1	4,074,819
138 R	4,074,820
	4,074,821
152	4,074,822
	4,074,823

CLASS 215

365	4,074,824

CLASS 219

10.71	4,075,450
51	4,075,451
121 EM	4,075,452
125.1	4,075,453
137 R	4,075,454
216	4,075,455
	4,075,456
218	4,075,457
225	4,075,458
375	4,075,459

CLASS 220

4 R	4,074,825
6	4,074,826
23	4,074,827
254	4,074,828

CLASS 221

238	4,074,829
266	4,074,830

CLASS 222

43	4,074,831
245	4,074,832
390	4,074,833
504	4,074,834
558	4,074,835
564	4,074,836
629	4,074,837

CLASS 223

85	4,074,838

CLASS 224

8 R	4,074,839

CLASS 225

96.5	4,074,840

CLASS 226

97	4,074,841

CLASS 227

8	4,074,842
	4,074,843
	4,074,844
10	4,074,845
51	4,074,846

CLASS 228

145	4,074,847
173 C	4,074,848

CLASS 229

1.5 B	4,074,849

CLASS 235

89 R	4,074,850
92 AC	4,075,463
92 EV	4,075,464
92 PC	4,075,462
145 R	4,075,465
302	4,074,851
302.3	4,075,466
420	4,075,460
463	4,074,852
466	4,075,461
477	4,074,853

CLASS 236

11	4,074,854
87	4,074,855

CLASS 238

349	4,074,860

CLASS 239

1	4,074,856
119	4,074,857
172	4,074,858
265.33	4,074,859
492	4,074,861
515	4,074,862
589	4,074,863

CLASS 241

23	4,074,864
24	4,074,865
30	4,074,866
	4,074,867
46 R	4,074,868
55	4,074,869

CLASS 242

1	4,074,870
42	4,074,871
55.54	4,074,872
75.43	4,074,873
77.1	4,074,874
118.3	4,074,875
199	4,074,876

CLASS 244

155 R	4,074,877
183	4,074,878

CLASS 246

37	4,074,879

CLASS 248

1	4,074,880
188.7	4,074,881
208	4,074,882
286	4,074,883
289 R	4,074,884
317	4,074,885
394	4,074,886
404	4,074,887
475 R	4,074,888

CLASS 250

199	4,075,474
227	4,075,477
231 SE	4,075,478
281	4,075,479
282	4,075,475
328	4,075,480
343	4,075,481
363 S	4,075,482
	4,075,483
366	4,075,484
369	4,075,485
374	4,075,486
385	4,075,487
396 R	4,075,488
401	4,075,489
445 T	4,075,490
	4,075,491
	4,075,492
461 R	4,075,493
479	4,075,494
483	4,075,495
492 B	4,075,496
505	4,075,497
562	4,075,498
574	4,075,499

CLASS 251

298	4,074,889

CLASS 252

8.8	4,075,110
12	4,075,111
35	4,075,112
	4,075,113
62	4,075,114
75	4,075,115
102	4,075,116
135	4,075,117
	4,075,118
182	4,075,119
301.4 P	4,075,120
407	4,075,121
437	4,075,122
	4,075,123
	4,075,124
455 R	4,075,125
	4,075,126
470	4,075,127
475	4,075,128
527	4,075,129
542	4,075,131
548	4,075,130

CLASS 254

29 A	4,074,890
150 FH	4,074,891
188	4,074,892

CLASS 256

13.1	Re.29,544
	4,075,473
21	4,074,893

CLASS 260

2 R	4,075,136
2.5 AT	4,075,137
2.5 B	4,075,138
2.5 F	4,075,139
5	4,075,140
17 R	4,075,142
17.2	4,075,141
	4,075,143
22 M	4,075,145
22 R	4,075,144
23 EP	4,075,148
23 H	4,075,146
	4,075,147
28.5 AS	Re.29,548
29.3	4,075,133
29.4 R	4,075,149
29.6 RW	4,075,134
29.7 DP	4,075,135
30.6 R	4,075,150
33.2 R	4,075,151
37 EP	4,075,153
37 N	4,075,152
37 SB	4,075,154
38	4,075,155
42.17	4,075,158
42.47	4,075,156
	4,075,157
	4,075,159
	4,075,160
45.7 P	4,075,163
45.7 S	4,075,164
45.8 A	4,075,161
45.8 N	4,075,165
45.8 NZ	4,075,162
45.95 H	4,075,166
46.5 E	4,075,167
46.5 G	4,075,170
46.5 R	4,075,168
	4,075,169
47 C	4,075,173
47 CP	4,075,171
47 CZ	4,075,172
47 ET	4,075,174
67 R	4,075,175
67.6 R	4,075,176
75 N	4,075,179
75 R	4,075,180
75 T	4,075,177
	4,075,178
77.5 B	4,075,181
78 P	4,075,182
79.3 M	4,075,185
79.3 MU	4,075,183
79.3 R	4,075,184
97.7	4,075,188
112 B	4,075,193
112.5 LH	4,075,191
	4,075,192
112.5 R	4,075,189
	4,075,190
	4,075,194
119	4,075,195
120	4,075,196
122	4,075,197
161	4,075,198
192	4,075,199
206	4,075,200
239 A	4,075,201
239.3 T	4,075,202
250 BC	4,075,204
	4,075,205
	4,075,206
	4,075,207
256.4 C	4,075,208
256.4 F	4,075,210
256.4 N	4,075,209
270 H	4,075,211
285	4,075,132
285.5	4,075,212
	4,075,213
287 B	4,075,214
294.8 C	4,075,215
	4,075,216
296 R	4,075,217
305	4,075,218
306.7 C	4,075,219
308 B	4,075,220
308 R	4,075,221
326.14 R	4,075,224
326.31	4,075,225
326.5 C	4,075,223
327 TH	4,075,226
330.5	4,075,227
332.3 P	4,075,228
340	4,075,229
345.3	4,075,230
346.4	4,075,231
346.75	4,075,232
397.3	4,075,233
417	4,075,234
453 RW	4,075,235
453 RZ	4,075,236
455 R	4,075,237
458 C	4,075,238
464	4,075,239
471 R	4,075,240
502.5	4,075,243
530 N	4,075,244
561 HL	4,075,245
584 C	4,075,246
590 C	4,075,247
600 R	4,075,248
613 D	4,075,249
621 C	4,075,250

638 B 4,075,251
649 F 4,075,252
665 R 4,075,253
667 4,075,254
672 R 4,075,255
680 E 4,075,256
680 R 4,075,257
683.44 4,075,258
683.68 4,075,259
830 TW 4,075,260
850 4,075,261
860 4,075,262
873 4,075,263
876 B 4,075,285
877 4,075,286
878 B 4,075,287
879 4,075,288
887 4,075,186
890 4,075,289
897 A 4,075,290
933 4,075,291
986 4,075,292

CLASS 261

20 4,075,293
34 A 4,075,294
36 R 4,075,295
41 D 4,075,296
104 4,075,297
114 TC 4,075,298

CLASS 264

25 4,075,299
32 4,075,300
40.7 4,075,301
44 4,075,303
46.5 4,075,264
4,075,304
53 4,075,265
89 4,075,187
92 4,075,266
94 4,075,267
138 4,075,268
184 4,075,269
209 4,075,270
210 F 4,075,271
249 4,075,272
250 4,075,273
290 T 4,075,274
313 4,075,275
332 4,075,276

CLASS 266

50 4,074,895

CLASS 267

71 Re.29,545
139 4,074,896

CLASS 269

43 4,074,897
4,075,302
228 4,074,898
249 4,074,899
254 R 4,074,900

CLASS 270

79 4,074,901

CLASS 271

34 4,074,902

CLASS 272

16 4,074,903
116 4,074,904

CLASS 273

26 D 4,074,905
243 4,074,906
282 4,074,907

CLASS 277

44 4,074,908

CLASS 280

11.12 4,074,909
289 R 4,074,910

CLASS 283

6 4,074,911

CLASS 285

14 Re.29,546
39 4,074,912
114 4,074,913
405 4,074,914

CLASS 290

55 4,075,500

CLASS 292

262 4,074,915
307 R 4,074,916

CLASS 294

7 4,074,917

CLASS 297

192 4,074,918
233 4,074,919

CLASS 299

18 4,074,920

CLASS 302

39 4,074,921

CLASS 307

41 4,075,501
64 4,075,502
66 4,075,503
4,075,504
88.3 4,075,505
117 4,075,506
4,075,507
213 4,075,508
251 4,075,509
252 B 4,075,510
270 4,075,511
311 4,075,512
350 4,075,513
355 4,075,514
362 4,075,515

CLASS 308

8.2 4,074,922
236 4,074,923

CLASS 310

13 4,075,517
49 R 4,075,518
67 R 4,075,519
168 4,075,520
184 4,075,521
214 4,075,522
239 4,075,523
249 4,075,524
329 4,075,525
334 4,075,516

CLASS 313

56 4,075,526
93 4,075,527
154 4,075,528
4,075,529
229 4,075,530
325 4,075,531
422 4,075,535
497 4,075,532

CLASS 315

31 R 4,075,533
39.71 4,075,534
209 R 4,075,476
241 P 4,075,536
354 4,075,537

CLASS 318

52 4,075,538
135 4,075,539
138 4,075,540
139 4,075,541
161 4,075,542
224 R 4,075,543
696 4,075,544

CLASS 320

61 4,075,545

CLASS 323

22 T 4,075,546
60 4,075,547
86 4,075,548

CLASS 324

0.5 AH 4,075,552
28 R 4,075,549
33 4,075,550
58 B 4,075,554
58.5 R 4,075,555
60 C 4,075,556
62 4,075,557
99 R 4,075,558
115 4,075,559
131 4,075,560
149 4,075,561
173 4,075,562
208 4,075,551
233 4,075,553
236 4,075,563

CLASS 325

55 4,075,564
138 4,075,565
369 4,075,566
453 4,075,567

CLASS 328

1 4,075,568
58 4,075,569
262 4,075,570

CLASS 329

104 4,075,571

CLASS 330

10 4,075,572
129 4,075,573
257 4,075,574
259 4,075,575
277 4,075,576

CLASS 331

17 4,075,577
56 4,075,578
94.5 G 4,075,579
96 4,075,580

CLASS 333

10 4,075,581
72 4,075,582
73 R 4,075,583

CLASS 335

20 4,075,584
78 4,075,585
79 4,075,586
112 4,075,587
207 4,075,588
286 4,075,589

CLASS 336

192 4,075,590
200 4,075,591

CLASS 337

139 4,075,592
312 4,075,593
348 4,075,594
407 4,075,595
408 4,075,596

CLASS 338

128 4,075,597

CLASS 339

20 4,074,924
44 R 4,074,925
60 R 4,074,926
89 M 4,074,927
91 R 4,074,928
97 R 4,074,929

CLASS 340

1 R 4,075,598
3 R 4,075,599
9 4,075,600
15 4,075,601
58 4,075,602
4,075,603
146.3 AC 4,075,605
146.3 AG 4,075,604
147 B 4,075,606
152 R 4,075,607
166 R 4,075,608
227.1 4,075,614
4,075,615
276 4,075,616
280 4,075,617
4,075,618
324 AD 4,075,620
324 R 4,075,619
337 4,075,621
347 DD 4,075,622
347 NT 4,075,623
384 E 4,075,624
4,075,625
388 4,075,626
4,075,627
416 4,075,628
421 4,075,629

CLASS 343

5 DP 4,075,630
6.5 R 4,075,631
6.8 R 4,075,632
100 LE 4,075,633
742 4,075,634
844 4,075,635

CLASS 346

75 4,075,636
153 4,075,637

CLASS 350

33 4,074,930
184 4,074,931

CLASS 351

111 4,074,932

CLASS 353

27 R 4,074,933

CLASS 354

23 D 4,075,638
25 4,075,639
31 4,075,640
43 4,075,641
82 4,075,642
86 4,075,643
173 4,075,644
187 4,075,645
209 4,075,646
217 4,075,647
238 4,075,648

CLASS 355

14 4,074,934
46 4,074,935

CLASS 356

81 4,074,936
109 4,074,937
160 4,074,938
206 4,074,939
246 4,074,940

CLASS 357

13 4,075,649
15 4,075,650
22 4,075,651
4,075,652
23 4,075,653
30 4,075,654

CLASS 358

13 4,075,655
4,075,656
93 4,075,657
96 4,075,658
108 4,075,659
124 4,075,660
166 4,075,661
280 4,075,662
283 4,075,663
286 4,075,664

CLASS 360

8 4,075,665
11 4,075,666
77 4,075,667
80 4,075,668
85 4,075,670
92 4,075,669
113 4,075,671
135 4,075,672

CLASS 361

10 4,075,673
27 4,075,674
48 4,075,675
56 4,075,676
93 4,075,677
104 4,075,678
285 4,075,680
305 4,075,681
386 4,075,682
415 4,075,683

CLASS 362

31 4,075,467
72 4,075,469
144 4,075,468
255 4,075,472
287 4,075,470
300 4,075,471
352 4,075,684

CLASS 363

44 4,075,685

CLASS 364

200 4,075,679
4,075,686
4,075,687
4,075,688
4,075,689
4,075,691
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4,075,693
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404 4,075,696
481 4,075,697
483 4,075,698
492 4,075,699
515 4,075,700
579 4,075,701
705 4,075,702
715 4,075,703
748 4,075,704
752 4,075,705
821 4,075,706
900 Re.29,550
4,075,707

CLASS 365

2 4,075,611
4,075,708
4,075,709
87 4,075,613
107 4,075,610
154 4,075,609
156 4,075,690
171 4,075,612

CLASS 366

7 4,074,894
25 4,075,710
26 4,075,711
79 4,075,712
192 4,075,713

CLASS 401

182 4,074,944

CLASS 403

174 4,074,943
197 4,074,945
260 4,074,941
364 4,074,946
406 4,074,947

CLASS 404

75 4,074,948
121 4,074,942

CLASS 407

114 4,074,949

CLASS 408

220 4,074,950

CLASS 415

2 4,074,951

CLASS 416

87 4,074,952
183 4,074,953

CLASS 417

218 4,074,955

CLASS 418

68 4,074,954
178 4,074,956
195 4,074,957

CLASS 423

55 4,075,277
4,075,278
118 4,075,280
206 T 4,075,281
230 4,075,282
239 4,075,283
244 4,075,284
320 4,075,305
352 4,075,306
413 4,075,307
478 4,075,308
497 4,075,309
574 R 4,075,310
636 4,075,311
648 A 4,075,312
658 4,075,313

CLASS 424

1 4,075,314
12 4,075,315
49 4,075,316
52 4,075,317
70 4,075,318
78 4,075,319
84 4,075,320
92 4,075,321
94 4,075,322
114 4,075,323
128 4,075,324
140 4,075,325
141 4,075,326
180 4,075,328
195 4,075,329
200 4,075,330
203 4,075,331
216 4,075,332
237 4,075,333
238 4,075,334
244 4,075,335
246 4,075,336
4,075,337
4,075,338
250 4,075,339
256 4,075,340
258 4,075,341
4,075,342
4,075,343
4,075,344
263 4,075,345
267 4,075,346
273 R 4,075,327
275 4,075,347
300 4,075,348
301 4,075,349
303 4,075,351
316 4,075,350
319 4,075,352
338 4,075,353
356 4,075,354

CLASS 425

71 4,074,958
81.1 4,074,959
89 4,074,960
112 4,074,961

CLASS 426

231 4,075,355
285 4,075,356
332 4,075,357
465 4,075,358
502 4,075,359
582 4,075,360
655 4,075,361

CLASS 427

22 4,075,362
27 4,075,363
34 4,075,364
36 4,075,365
44 4,075,366
94 4,075,367
185 4,075,369
216 4,075,370
224 4,075,371
258 4,075,372
327 4,075,373
355 4,075,374
390 R 4,075,375

CLASS 428

36 4,075,376
95 4,075,377
97 4,075,378
105 4,075,379
140 4,075,380
192 4,075,381
4,075,382
198 4,075,383
212 4,075,384
215 4,075,385
216 4,075,386
288 4,075,387
297 4,075,388
306 4,075,389
307 4,075,390
407 4,075,391
457 4,075,392
4,075,393
537 4,075,394
542 4,075,395

CLASS 429

17 4,075,396
50 4,075,397
56 4,075,398
57 4,075,399
62 4,075,400
89 4,075,401
98 4,075,402
161 4,075,368
253 4,075,403

CLASS 431

255 4,074,962

CLASS 432

250 4,074,963

CLASS 526

237 4,075,404

CLASS 536

1 4,075,405
4,075,406
88 4,075,279

CLASS 542

412 4,075,407

CLASS 544

18 4,075,203

CLASS 548

324 4,075,408
336 4,075,222

CLASS 560

36 4,075,409
73 4,075,241
87 4,075,410
190 4,075,242
224 4,075,411
244 4,075,412
4,075,413

CLASSIFICATION OF DESIGNS

D2—	230	247,266	D7—	9	247,277	D12—	57	247,288	D22—	13	247,299			247,310		5 J	247,321
	310	247,267		181	247,278		60	247,289			247,300		64	247,311		15 AE	247,323
	400	247,268	D8—	42	247,279		97	247,290		28	247,304			247,312		15 BB	247,322
D6—	63	247,269	D9—	71	247,280		154	247,291		31	247,301	D25—	80	247,314	D48—	24 A	247,324
	85	247,270			247,281		189	247,292	D23—	18	247,302		87	247,313	D64—	11A	247,325
	105	247,271			247,282	D13—	32	247,293		34	247,303	D27—	39	247,315	D87—	1 R	247,327
	130	247,272		157	247,283	D15—	123	247,294		127	247,305			247,316		5 F	247,326
	135	247,273	D10—	11	247,284	D16—	27	247,295		142	247,306	D28—	7	247,317	D88—	3 R	247,328
	172	247,274		50	247,285		31	247,296	D24—	3	247,307	D31—	1	247,318			247,329
	177	247,275	D11—	134	247,286		50	247,297		9	247,308	D34—	5 G	247,320	D96—	12 R	247,330
	184	247,276		155	247,287	D19—	76	247,298		56	247,309		5 GH	247,319			

CLASSIFICATION OF PLANTS

P.—	69	4,216		74	4,217												

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Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 4,074,685	4,074,751	4,075,509	4,074,844	4,074,814	4,075,144
4,074,868	4,074,811	4,075,513	4,074,923	4,075,356	4,075,147
4,075,512	4,074,819	4,075,514	4,074,928	4,075,436	4,075,153
4 : 4,074,389	4,074,831	4,075,536	4,074,937	4,075,549	4,075,195
4,074,396	4,074,832	4,075,569	4,074,952	16 : 4,074,679	4,075,259
4,074,522	4,074,856	4,075,571	4,075,058	4,074,735	4,075,273
4,074,662	4,074,857	4,075,576	4,075,065	4,074,792	4,075,289
4,075,083	4,074,877	4,075,579	4,075,176	17 : Re.29,542	4,075,302
4,075,508	4,074,881	4,075,583	4,075,303	Re.29,549	4,075,313
4,075,573	4,074,883	4,075,597	4,075,312	4,074,365	4,075,315
4,075,578	4,074,893	4,075,608	4,075,343	4,074,377	4,075,339
4,075,649	4,074,898	4,075,609	4,075,350	4,074,381	4,075,366
4,075,686	4,074,904	4,075,611	4,075,364	4,074,410	4,075,389
5 : 4,074,454	4,074,907	4,075,621	4,075,435	4,074,424	4,075,407
6 : Re.29,548	4,074,908	4,075,622	4,075,542	4,074,434	4,075,430
Re.29,550	4,074,912	4,075,651	4,075,544	4,074,449	4,075,487
4,074,364	4,074,918	4,075,656	4,075,584	4,074,452	4,075,503
4,074,375	4,074,926	4,075,666	10 : Re.29,547	4,074,486	4,075,504
4,074,380	4,074,927	4,075,667	4,074,649	4,074,561	4,075,510
4,074,385	4,074,932	4,075,668	4,074,919	4,074,581	4,075,531
4,074,397	4,074,944	4,075,684	4,075,031	4,074,592	4,075,562
4,074,403	4,074,946	4,075,688	4,075,051	4,074,613	4,075,581
4,074,406	4,074,981	4,075,691	4,075,150	4,074,614	4,075,625
4,074,407	4,074,986	4,075,702	4,075,175	4,074,615	4,075,627
4,074,408	4,075,043	4,075,703	4,075,201	4,074,616	18 : 4,074,578
4,074,411	4,075,073	4,075,707	4,075,262	4,074,665	4,074,591
4,074,420	4,075,084	4,075,708	4,075,378	4,074,674	4,074,594
4,074,447	4,075,085	4,075,709	12 : 4,074,379	4,074,690	4,074,675
4,074,473	4,075,087	8 : Re.29,545	4,074,386	4,074,693	4,074,684
4,074,475	4,075,108	4,074,718	4,074,451	4,074,703	4,074,698
4,074,478	4,075,111	4,074,809	4,074,456	4,074,714	4,074,812
4,074,487	4,075,139	4,074,971	4,074,481	4,074,716	4,074,813
4,074,526	4,075,182	4,075,068	4,074,523	4,074,767	4,074,830
4,074,527	4,075,207	4,075,071	4,074,559	4,074,768	4,074,850
4,074,535	4,075,246	4,075,438	4,074,650	4,074,772	4,074,899
4,074,563	4,075,267	4,075,639	4,074,800	4,074,794	4,074,915
4,074,564	4,075,300	4,075,671	4,074,897	4,074,796	4,074,916
4,074,580	4,075,347	4,075,679	4,074,914	4,074,820	4,074,972
4,074,606	4,075,361	4,075,698	4,074,964	4,074,836	4,074,998
4,074,607	4,075,385	9 : Re.29,544	4,075,257	4,074,846	4,075,000
4,074,608	4,075,420	4,074,366	4,075,304	4,074,848	4,075,003
4,074,628	4,075,434	4,074,382	4,075,353	4,074,853	4,075,164
4,074,653	4,075,444	4,074,427	4,075,417	4,074,896	4,075,171
4,074,672	4,075,462	4,074,446	4,075,439	4,074,902	4,075,179
4,074,694	4,075,464	4,074,512	4,075,473	4,074,911	4,075,203
4,074,710	4,075,478	4,074,572	4,075,550	4,074,942	4,075,206
4,074,711	4,075,479	4,074,574	4,075,600	4,074,985	4,075,212
4,074,723	4,075,480	4,074,588	4,075,606	4,075,033	4,075,213
4,074,726	4,075,481	4,074,671	4,075,676	4,075,054	4,075,214
4,074,731	4,075,491	4,074,682	13 : 4,074,511	4,075,056	4,075,218
4,074,734	4,075,492	4,074,706	4,074,619	4,075,086	4,075,219
4,074,739	4,075,493	4,074,713	4,074,705	4,075,099	4,075,223
4,074,742	4,075,505	4,074,758	4,074,791	4,075,133	4,075,227

4,075,230
4,075,238
4,075,323
4,075,344
4,075,470
4,075,614
4,075,661
4,075,677
19 : 4,074,545
4,074,639
4,074,717
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4,074,770
4,074,821
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20 : 4,074,371
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4,075,635
21 : 4,074,417
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4,075,617
22 : 4,074,540
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23 : 4,074,977
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24 : 4,074,367
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25 : 4,074,383
4,074,416
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26 : 4,074,432

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27 : 4,074,477
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28 : 4,074,652
4,074,801
29 : 4,074,384
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30 : 4,074,951
4,075,602
31 : 4,074,766
4,074,783
32 : 4,074,894
33 : 4,074,635
4,074,704
4,074,771
34 : 4,074,405
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36 : Re.29,543
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37 : 4,074,391
4,074,455
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4,075,383
38 : 4,074,782
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39 : 4,074,418
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DESIGN PATENTS

6	:	247,271			247,294	18	:	247,269		247,301	
		247,299	9	:	247,267			247,300		247,324	
		247,309			247,292	24	:	247,322	34	: 247,313	
		247,310			247,316	25	:	247,315	36	: 247,275	
		247,321	12	:	247,302	26	:	247,288		247,279	
		247,325			247,319	27	:	247,320		247,280	
		247,326			247,327	29	:	247,270		247,281	
8	:	247,272	17	:	247,312			247,297		247,295	
		247,290									

		247,314			247,289						
		247,330	42	:	247,318						
37	:	247,304	44	:	247,298						
		247,308	46	:	247,284						
39	:	247,278	48	:	247,306						
		247,283			247,311						
		247,293	49	:	247,286						
41	:	247,285	53	:	247,291						

PLANT PATENTS

17	:	4,217									

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